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YOU BEEN  
EVERWHERE  
YET?

# Newsweek

NOVEMBER 27, 2015 / VOL. 165 / NO. 19



## FEATURES

### 22 The Fort Knox of Food

In the bowels of an unassuming building in the Colorado Front Range is a library of plant and animal material that could keep humanity thriving for centuries to come. *by Sena Christian*

### 30 Return of the Dictators

The hopes of the Arab Spring are dashed, and Egypt is again setting the standard for oppression in the region. *by Janine di Giovanni, with additional reporting by Noah Goldberg*

COVER CREDIT: GETTY

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**GOVERNMENT**  
**BRUTALITY:** A man sits near a relative slain when Egyptian forces killed nearly 1,000 protesters in 2013. Egypt is among the nations that have cracked down harshly on those seeking democracy.

**20 Myanmar**  
Free and Unfair

**21 Conventional Wisdom Watch**

## NEW WORLD

**46 Climate**  
Matters of the Earth

**50 Weather**  
The Weather Channel-Changer

**52 Green**  
Green Smoke Screen

**56 Water**  
Underwater Desert

## DEPARTMENTS

### BIG SHOTS

- 4 Paris**  
Friday the 13th
- 6 Sinjar, Iraq**  
Liberation
- 8 Beirut**  
Suicide Homicide
- 10 Sochi, Russia**  
False Start

### PAGE ONE

- 12 Paris**  
A Long Twilight Struggle
- 19 Business**  
Rolling in the Deep Sales



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BIG  
SHOTS

FRANCE

## Friday the 13th

Paris—Emergency workers aid victims of an attack at the Bataclan theater, one of six sites where coordinated shootings and suicide bombings killed at least 129 people in the French capital on November 13. The Islamic State militant group (ISIS) claimed responsibility for the attacks, which also wounded around 350 people. ISIS said it struck France for its role in the coalition that is fighting it in Syria and vowed that the attacks were just “the first of the storm.” In response, French President François Hollande said his country was now “at war” with ISIS and launched air-strikes against Raqqa, Syria, the group’s self-proclaimed capital.



MOLAND FENGKOV



IRAQ

## Liberation

**Sinjar, Iraq—** Peshmerga forces advance toward ISIS militants on November 11, hours before retaking this northwestern town with the help of U.S.-led coalition airstrikes. After two days of intense fighting, ISIS withdrew, allowing peshmerga forces to retake Sinjar unopposed. In August 2014, the town was the site of one of the worst massacres perpetrated by ISIS, in which thousands of Yazidis were killed. Thousands more women and children from the sect were abducted and forced into sexual slavery by the militant group.



ALI ARKADY





BILAL HUSSEIN/AP

LEBANON

## Suicide Homicide

Beirut—A Lebanese soldier fires into the air on November 12 to disperse people gathered around a man on the ground they accused of being linked to two suicide bombings in a residential neighborhood, which killed 43 people. ISIS claimed responsibility for the attack, which also wounded more than 200. The neighborhood was targeted, ISIS said, because it wanted to strike deep in the heart of Hezbollah's home base. A Shiite militant group allied with Syrian President Bashar al-Assad, Hezbollah has been on the front lines of the fight against ISIS in Syria.



BILAL HUSSEIN



**RUSSIA**

## False Start

Sochi, Russia—An athlete jumps a hurdle during a training session at the Yunost Sports Complex on November 12. The following day, the International Association of Athletics Federations voted to provisionally ban Russia's track and field athletes from world athletic competitions after the World Anti-Doping Agency's report on "state-sponsored doping." The Kremlin had previously dismissed the findings, which implicated Russia's anti-doping agency and drug-testing lab in the destruction of blood test samples and other violations, as "groundless" but has since begun investigating the allegations.



DMITRY LOVETSKY

## A LONG TWILIGHT STRUGGLE

The November 13 attacks in Paris were shocking, but don't expect them to mark the end of a war that began almost a decade and a half ago

**SEPTEMBER 11.** Madrid. 7/7. Mumbai. And now Paris. On Friday the 13th.

Just the dates and the locations. They are the grim shorthand markers of a war whose end has never been visible; a war that will now intensify; a war that has become central to our times and may still be central for our sons and daughters.

The world was shocked by the latest attack on civilians, killing (as this is written) at least 129, with hundreds more wounded, all for the crime of being out on a Friday night in the West's most glorious city. Just eight attackers—inspired and apparently organized by the so-called Islamic State (ISIS), the radical Islamist group spawned by Al-Qaeda in Iraq—fanned out and struck. Two, wearing suicide vests, blew themselves up, killing one, outside a packed soccer stadium in northern Paris, where French President François Hollande and thousands of others were watching France play Germany. Others

marched into three separate restaurants and two bars and murdered 39 people. And at the Bataclan concert hall, three gunmen methodically shot hundreds, killing 89. Two of the shooters were killed when they detonated suicide vests. Another was shot when French police stormed the venue just after midnight. At least one suspect is on the run.

The attacks, like all those that have come before over the past nearly decade and a half, were shocking and enraging. But this one, arguably, was more depressing than the rest.

Why? Because to anyone paying attention, this attack seemed inevitable. That a major Western capital would get hit (again) was a matter of if, not when. It was a function of the growing carnage in the Middle East and Northern Africa. And it stems most directly from Syria, where well over 200,000 have been killed in a vicious, multisided civil war, one that has

BY  
**BILL POWELL**

*With Janine di Giovanni in Paris, Jeff Stein and Jonathan Broder in Washington, and Lucy Kafanov in Berlin*





TOMAS MUNITA/THE NEW YORK TIMES/REDUX

**NEW MOURNING:**  
People gather outside Le Carillon, one of several restaurants and bars where attackers killed a total of 39 people.



driven hundreds of thousands of refugees out of the country—many seeking shelter in the West.

For months, intelligence, defense and police officials in Western Europe had fretted about the likelihood that amid the refugees would be soldiers of ISIS, ready to attack. On Friday the 13th in Paris, those fears might have been realized. At least one of the gunmen might have carried a Syrian passport, possibly having traveled via Greece. If so, it was the first such attack involving a “refugee” from Syria. And it is not

THE ANGER IN FRANCE THAT FOLLOWED THIS TIME IS, UNMISTAKABLY, MIXED WITH A SENSE OF DREAD.



**HOLD TIGHT:**  
Parisians and visitors  
came out to lay flowers  
and candles at the  
sites of the attacks,  
but nerves were on  
edge and people  
panicked when they  
were startled by a  
noise outside Le Petit  
Cambodge restaurant  
on November 15.

likely to be the last. Paris, ISIS claimed in the aftermath, “was the first of a storm.” A Western intelligence official tells *Newsweek*, “There’s no reason not to believe them.”

That wasn’t the only reason Paris 11/13 seemed inevitable. Intelligence officials in Europe and the United States had been vexed by the prospect of ISIS sympathizers bearing Western passports; of young Muslim men being “radicalized” by the ongoing wars in Syria, Iraq and Libya; and by ISIS’s call to arms, transmitted



most effectively through a sophisticated recruiting campaign on social media. Some go and fight for ISIS on its battlefields and then return to Europe. (On November 16, French authorities said the attack’s mastermind was a Belgian passport holder who had fought in Syria.) Others stay behind and stew—and plot. That, apparently,



was the case in Paris. Some of the attackers carried French passports, authorities say.

In the aftermath of September 11—the most spectacular and lethal of the attacks by radical jihadis—an enraged United States, backed by most of the world, immediately prepared to fight the war that had been brought to it. And in the wake of the Paris attack, Hollande called it (accurately) an act of war and vowed to be “merciless” in response. Within less than 48 hours, France had dramatically stepped up its airstrikes against ISIS targets in Syria—including one on the militant group’s main stronghold, the city of Raqqa.

The anger in France and the West is, unmistakably, mixed with a sense of dread, for three big reasons. First, listen to those who have, for nearly 15 years, tried to come to grips with Islamist attacks explain what we need to do *now*:

The disaffected, underemployed young Muslims of Europe, whether they are in the *banlieues* of Paris, the outskirts of England's Manchester or the suburbs of Amsterdam, must be brought out of the shadows. They must be made to feel part of mainstream European society rather than feeling welcome only in their local mosques. And those mosques must not be radical. If they are, they need to be de-radicalized. The same goes for mosques throughout the Islamic world: Syria, Iraq, Pakistan or Saudi Arabia. The strain of Islam that leads young men to fight must be eliminated.

Toward this end, others argue, the United States and its Western allies must once and for all insist that Saudi Arabia and the other Gulf Arab states stop allowing their citizens to fund radical Islamist groups. Western intelligence officials believe Gulf oil money helped fund Al-Qaeda going back to the late 1990s, if not earlier. Enough is enough.

Finally, much of the Islamic world must reform its educational system, clamping down on hard-line religious schools that exist to indoctrinate their students, while also helping young people prepare for the modern world and giving them something else to believe in, to strive for, other than fighting for ISIS. The war, nearly everyone agrees, cannot be won by military means alone.

The sentiments are all fine. Indeed, they are all true. Hardly anyone disagrees on what needs to be done. What, then, is the problem with them? Only this: The experts—the diplomats, the counterintelligence officials, the academics—were saying *the exact same things* in the immediate aftermath of September 11. What has happened since then? It's likely that there are more radical mosques today than there were then, both in the Islamic world and in the West. Do we know whether more—or less—money flows from the Gulf to Sunni radical groups—Al-Qaeda and its various franchises and now ISIS? The number of young people in the West and in the Islamic world attracted to jihadi groups and willing to die for them is, mercifully, a very small minority. But thousands have still traveled to Syria and Iraq to join the Islamist radicals.



The Paris attacks unfolded just as diplomats from concerned countries gathered under U.N. auspices in Vienna for the second round of talks aimed at reaching some sort of negotiated settlement to the war in Syria, the current epicenter of the broader conflict. The United States, the European Union, Iran, the Saudis, the Russians and the Turks were all there. And while, diplomats say, the carnage in Paris has for the moment concentrated minds—bringing the fight to ISIS now appears to top the world's agenda, at least rhetorically—there's little indication that this moment of unity will pave the way for a peace deal in Syria.

In many respects, little has changed. The position of the United States—and even more fervently, the French, the Sunni Arabs and the Turks—is that Syrian dictator Bashar al-Assad must go. The main goal of the rebel groups, including the so-called moderates that the U.S. has been helping, has also been to depose Assad, rather than defeating ISIS (which counts Assad among its growing list of enemies). The rebels' focus on battling Assad's forces has slowed the fight on the ground against ISIS.



CLOCKWISE FROM LEFT: NOLAND TENG/ONCALL/SHUTTERSTOCK; GUY LAWRENCE/SHUTTERSTOCK; PIERRE ASSAL/HANNAH THAM/SHUTTERSTOCK; AARON FOR NEWSWEEK; PIERRE ASSAL/HANNAH THAM/SHUTTERSTOCK



**BLACK FRIDAY:** Emergency services recover a body outside the Bataclan music hall, left, where 89 people were killed. France declared three days of national mourning, and the country paused for a minute's silence at noon on November 16.

+



Getting rid of Assad is emphatically *not* the goal of two of the other major players in the conflict: Iran and Russia. Since the start of the civil war, Iran has been sending troops and matériel to help Assad. The Russian military has spent more time bombing relatively moderate rebel groups than it has spent targeting ISIS. According to an analysis done by the Institute for the Study of War, only one Russian airstrike out of 14 launched between November 13 and 15 was aimed at an ISIS target. Apparently, Russian President Vladimir Putin has done enough to put

Russia on ISIS's radar, however: The group claimed to have planted a bomb on the Russian airliner that crashed on October 31 while flying from the Egyptian resort town of Sharm el-Sheikh, killing all 224 people on board. Western intelligence agencies believe ISIS was indeed responsible.

In the fight against ISIS, France's Hollande now appears to be all in. The attacks have put pressure on U.S. Pres-

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**“THE DAYS OF UNCHECKED IMMIGRATION AND ILLEGAL ENTRY CAN’T CONTINUE JUST LIKE THAT. PARIS CHANGES EVERYTHING.”**

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ident Barack Obama to intensify what has been at best a halting effort to, in his words, “degrade and ultimately defeat” the militant group. But is the West going to put hundreds or even thousands of boots on the ground in Syria and Iraq? Will Sunni Arab nations commit men into battle—as Washington wants—if the ultimate goal does *not* include getting rid of Assad? And if not, can ISIS be defeated?

The final reason for despair post-Paris is the inevitable impact the attack will have on European politics. In France, heading into the first round of local elections on December 6, the

far-right party led by Marine Le Pen, the National Front, led in the polls. The party had been bitterly critical of what it considered the government's overly liberal immigration policies when the Pan-European refugee crisis began last summer. It has already started to use the November 13 attack—and the alleged holder of the Syrian passport—in its campaign rhetoric. Addressing the French prime minister, Manuel Valls, on November 14, National Front candidate Louis Aliot asked, "You see where the danger lies? The real danger?"

That question is equally potent next door in Germany, where Chancellor Angela Merkel has presided over an "open door" immigration policy. Berlin has waved in 760,000 refugees this year. Markus Söder, finance minister for the southern state of Bavaria, told a German weekly newspaper on November 14, "The days of unchecked immigration and illegal entry can't continue just like that. Paris changes everything."

In Poland, the government had committed to taking in 4,500 Syrian refugees. But on November 14, the incoming minister for European affairs, Konrad Szymanski, said, "We will accept refugees only if we have security guarantees." That won't happen; no country is capable of doing background checks on the hundreds of thousands of people fleeing the war in Syria.

Jean-Claude Juncker, president of the European Commission, warned on November 15 against giving in to what he called "base reactions" over the refugee crisis. Thus, anybody worried that there might be a terrorist or two tucked in among the refugees is, even in the wake of Paris, having a "base reaction." If, in fact, one of the attackers was a Syrian passport holder, the European political establishment will struggle to sell that line to unnerved citizens.

Some of those citizens—and voters—may not appreciate the lectures when their own governments have repeatedly failed to protect them.



**FORTRESS FRANCE:**  
Security forces  
tightened controls  
at the borders,  
including the Mont  
Blanc Tunnel to  
Italy, after a state  
of emergency was  
declared.

The French security services are among the most professional and adept in the world, and while Western intelligence sources say they had some inkling something was afoot, the French still missed an assault far more ambitious than the murderous attack on the satirical magazine *Charlie Hebdo* this past January.

When some of the best police officers in the world fall short of stopping such a well-coordinated attack, it's safe to say that they are facing a determined, dexterous enemy that will

## THE EXPERTS—DIPLOMATS, COUNTERINTELLIGENCE OFFICIALS, ACADEMICS AND SOCIAL WORKERS—WERE SAYING THE EXACT SAME THINGS IN THE IMMEDIATE AFTERMATH OF SEPTEMBER 11.

not be defeated quickly. In the wake of September 11, many inside and outside of government warned that we were, again, in a "long twilight struggle," as we were in the Cold War. That phrase is now being recycled, as a reminder that we, the West, have fought and won long wars in the past. That this is a long war there can be no doubt, although its outcome is. And nearly a decade and half after September 11, it feels as if it's starting anew. ■



## Rolling in the Deep Sales

ADELE SMASHES A DIGITAL-PURCHASE RECORD WITH HER FIRST SINGLE IN YEARS

Sadness sells. Just ask Adele, whose moody single "Hello"—her return after a three-year seclusion—has topped the charts in more than two dozen countries. "Hello from the other side," the British soul singer wails, and while the lyric seems to address an estranged lover, it could also work as a taunt to Adele's competitors in the music industry: "Hello" is a record-setter.

The song dropped in late October and soon became the first track to reach a million digital sales in one week. In fact, it smashed a record held by rapper Flo Rida, whose

single "Right Round" hit 636,000 downloads in February 2009. With first-week sales of 1,112,000, "Hello" nearly doubled that benchmark.

Adele's accomplishment illustrates how the metrics for pop chart success have changed—and are still changing—in the digital age. Records like James Taylor's *Before This World* (2015) and Tom Petty and the Heartbreakers's *Hypnotic Eye* (2014) routinely hit No. 1 not because these aging stars are still the rock gods they've always been but because the CD-buying population is older and more nostalgic than

ever before. Teens and 20-somethings (a substantial portion of Adele's audience) are more likely to consume music online. A year ago, *Billboard* began incorporating track streams and digital song sales for the first time. The magazine has also introduced a Trending 140 chart to track which songs are being shared the most on Twitter.

It also now takes fewer and fewer album sales to land in the top slot. Taylor moved under 100,000 units in his first week. A decade before, for comparison, Mariah Carey's *The Emancipation of Mimi* reached No. 1 with

404,000 first-week sales.

The music business hopes Adele's 25 will do this year what Taylor Swift's 1989 did in 2014—inject huge sales into the failing industry right before the holidays. Experts predict the record could ultimately sell up to 1.8 million copies.

"I'm excited about selling thousands and thousands of Adele records," a New England retailer told *Rolling Stone*.

So the next time Adele drunk-dials a lost acquaintance, she'll have another thing she can gloat about.

BY

ZACH SCHONFELD  
Twitter: @zzzzaaaacccchhh

SOURCE: BILLBOARD



## Free and Unfair

WILL MYANMAR'S NEW GOVERNMENT PROTECT THE HUNDREDS OF THOUSANDS OF ROHINGYA MUSLIMS EXCLUDED FROM VOTING IN THE COUNTRY'S MUCH-LAUDED ELECTION?

AS MILLIONS of voters cheered the outcome of Myanmar's elections in November, 52-year-old Abu Tahay was muted in his celebrations. Although the National League for Democracy (NLD), led by Nobel laureate Aung San Suu Kyi, won a landslide victory, ending 53 years of military or military-backed rule, Tahay found it hard to toast a party he couldn't even vote for. By law, Tahay, a Rohingya Muslim who briefly held a seat in parliament and has met both U.S. President Barack Obama and British Prime Minister David Cameron, was not allowed to take part in the elections. He, along with the country's 1 million other Rohingya, was excluded from the electoral process.

It was a painful blow to a group that is one of the most persecuted in the world. Although the Rohingya have lived in Myanmar for centuries, they are officially stateless. Myanmar, a primarily Buddhist country also known as Burma, classifies them as illegal Bengali immigrants. In the country's 2014 census, they could register only if they listed their nationality as Bengali. For decades,

extremist Buddhists have persecuted them. In 2012, violence between Rohingya Muslims and Buddhist nationalists in Rakhine state left 200 people dead and 140,000 displaced. Thousands of Rohingya have tried to flee abroad, many dying in the attempt.

For some Rohingya, the NLD victory is merely the least bad outcome. "We supported them during the election, even though they were quiet on our issues," Tahay says, speaking by phone from Yangon, Myanmar's largest city. Despite her status as a human rights activist, Suu Kyi did not condemn the Rohingya's persecution during her campaign. In June, she said, "the protection of the rights of minorities...is

such a sensitive issue, and there are so many racial and religious groups, that whatever we do to one group may have an impact on other groups as well." Critics accused Suu Kyi of not wanting to alienate potential voters. "We look at Daw Aung San Suu Kyi as a democratic icon. We are very disappointed in her," says Tahay.

Tahay has been waiting three and a half years for Myanmar's election commission to authorize his political party, the Union National Development Party. Tahay is hoping the NLD, now that it has won power, will protect his people. He may have good reason to be optimistic. Following the elections, Win Htein, a senior figure in the NLD, criticized the 1982 Citizenship Law,

which denies the Rohingya citizenship. "It must be reviewed because it's too extreme," Htein said. In December 2014, the U.N. General Assembly called on Myanmar to amend the law. Htein echoed the U.N.'s demands, adding that amendments should be made "so that we consider those people who are already in our country, maybe second generation...as citizens."

The Rohingya still face a long wait for potential change. Myanmar's new government will not be sworn in until March. Should it alter the citizenship laws, there is still no guarantee those persecuting the Rohingya will see them as their equals. It may be years before the Rohingya can truly call Myanmar home. 

**NOT WANTED:**  
Rohingya people like this woman near Sittwe, in Rakhine state, live segregated in camps for internally displaced people, stripped of the rights of citizens.

BY  
**MIRREN GIDDA**  
 @MirrenGidda

## Names in the News

UP, DOWN AND SIDEWAYS

 @WisdomWatch



### STARBUCKS

 Simple red holiday cup upsets some Christians for not being Christmas-y enough. Critics allege that coffee chain has joined so-called "war on Christmas" and is attacking traditional values by shunning clichéd Christmas images. In a press statement, Jesus confirms he's switching to Peet's.

### SOCKER

 To prevent brain damage, sport bans headers for kids 10 and younger. Cristiano Ronaldo chimes in: "The brain is the most essential organ for a soccer player. Look at me: All of my success is attributable to my brain."



### DOODLING

 Crayon king Crayola hopes to tap into booming market for coloring books with mature themes. Shades announced for next 64-pack include *Credit Card Debt Red*, *Kid Vomit* and *Husband Liver Spots*.



### NEWS

 "Hard news in danger," says Brookings Institution, being replaced by opinion journalism. Reporters laid off while think pieces proliferate. Here's 10,000 words on how you should feel about that...



### PORTLAND

 Getting too expensive for hipsters. City faces gentrification and rising rents. Worse, quality weed is now 15 bucks a gram, forcing stoners to roll roaches with boycotted Starbucks Christmas cups.

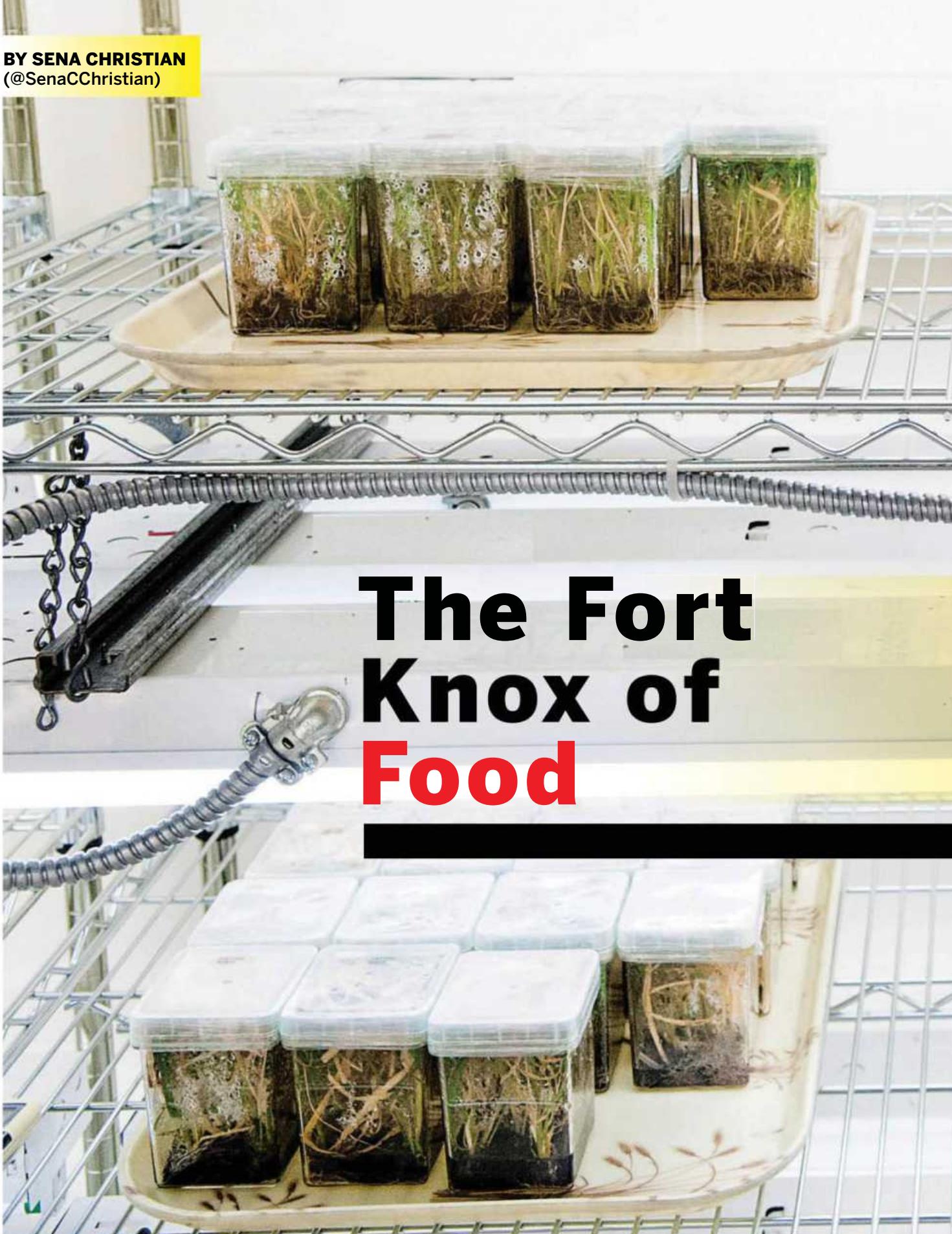


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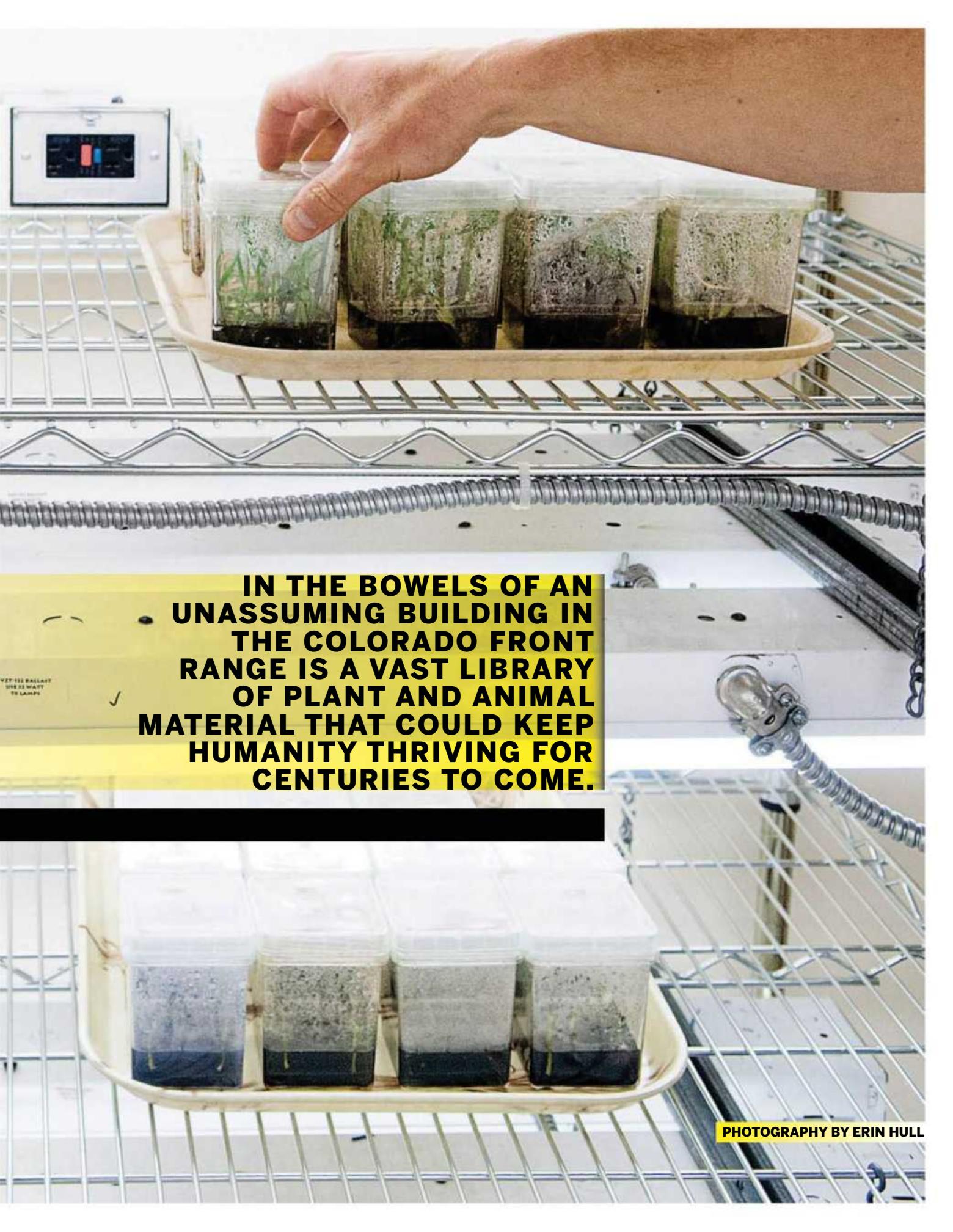
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BY SENA CHRISTIAN  
(@SenaCChristian)



# The Fort Knox of Food



IN THE BOWELS OF AN UNASSUMING BUILDING IN THE COLORADO FRONT RANGE IS A VAST LIBRARY OF PLANT AND ANIMAL MATERIAL THAT COULD KEEP HUMANITY THRIVING FOR CENTURIES TO COME.

PHOTOGRAPHY BY ERIN HULL



# In 1948, botanist **F.W. Went** began a modest experiment that has

since grown into what is now a massive science project networked across the globe with ambitions of saving humankind. But its initial goal sought to answer a remarkably simple question: How long do seeds survive?

The year the project launched, *Life* magazine wrote about the “wonderfully unhurried” experiment intended to last 360 years, complete with a photo of Went standing behind shelves lined with 2,400 slender glass tubes holding 120 types of dried seeds from California-native plants. Now, 67 years later, Went’s seeds reside in a beige multistoried building off the quad of Colorado State University in Fort Collins. Its blandness masks the significance of the project it houses. This “Fort Knox” of gene banks—the nickname for the National Center for Genetic Resources Preservation (NCGRP) of the U.S. Department of Agriculture (USDA)—is designed to safeguard the American food supply from the numerous threats posed by a rapidly changing planet. The stakes couldn’t be higher. Droughts, floods, sea-level rise, ocean acidification and the resulting hunger, malnutrition and mass displacement of people will likely become more severe in coming years because of climate change. And though poor people in developing countries will be on the front lines, even wealthier nations like the U.S. are going to have to come to terms with the urgent need for action.

Additionally, the world is losing biodiversity at an alarming rate. Many believe Earth has entered its sixth mass extinction: a human-induced and accelerated decline of animal and plant species of massive proportions.

What remains needs to be kept alive and available for breeding. Otherwise, the material could be lost forever—and when crop and livestock diversity is lost, so is our food supply’s resiliency to environmental threats. We can’t let that happen because the world’s population is projected to increase to 10 billion by 2050. And that’s a lot of mouths to feed.

## **SEmen, SEeds AND A PRAYER**

**The project** to track and preserve promising plants for sustenance is over a century old. In 1898, the U.S. government began gene banking, establishing “plant introduction stations” around the country where scientists could evaluate plants and preserve seeds. The USDA sent explorers to Asia, Europe and South America to collect fruits, vegetables and grains. In 1958, it established the National Seed Storage Laboratory on Colorado’s Front Range—the urban corridor along the eastern foothills of the Rockies—to consolidate the stash from these stations and the collections of other institutions, including the Went experiment (which had been stored at the Rancho Santa Ana Botanic Gardens). That laboratory later became the U.S.’s Fort Knox of food.

North-central Colorado is ideal for storing seeds because the thin air from the high altitude, low humidity and temperate climate make the water content of seeds easy to control, maximizing their longevity. In 1999, the NCGRP incorporated blood, semen, ovaries, testes and embryos from livestock breeds, adding to its massive collection of seeds, buds, stems and pollen from plants and cultivars. Scientists intend to preserve this material for hundreds—and in some cases thousands—of years. In doing so, they collaborate with scientists of the past, and leave an invaluable resource for those of the future.

Went’s samples are still around, though the method he used is woefully outdated: They are in vacuum-sealed

**FOR GENERATIONS: Today, the NCGRP in Colorado houses hundreds of thousands of genetic material samples (right), but it all started with 120 seed types gathered by F. W. Went (above).**



glass tubes, which are not fully secure, and are still stored at room temperature. "We would never do this now. It really is vintage," says Christina Walters, as she hunches her shoulders, hugging the metal container holding the tubes of seeds, struggling to pry open the lid. Walters is a plant physiologist who supervises the NCGRP's Plant Germplasm Preservation Research Unit. "There you go," she says, twisting off the top, reaching inside to pull out a package wrapped in brown paper—not much different from a paper lunch bag—with "2307" scrawled on it in black marker: the year the parcel should be opened and the seeds tested.

Walters gets excited when talking about all things seed. As a graduate student at Cornell University in the 1980s, she became fascinated by the fact that plant seeds can survive for years even after having been sucked dry of water, the life force. She even wrote her Ph.D. thesis on the subject. "Seeds are by far the largest class of biological material that survives desiccation," she says. A dehydrated plant is dead biomatter. Dry out a person? She's a goner. But seeds will outlast us all.

### **BLIGHT, FIGHT, REPEAT**

**Deep in the center's** guts are cold-storage vaults built to withstand flooding (if, for example, the nearby Horsetooth Dam breaks), earthquakes, hurricane-force winds and the impact from a 2,500-pound object hurled at 125 miles per hour—an object, Walters says, "like a Cadillac," propelled, perhaps, by a tornado.

The temperature of the freezer vault within is zero degrees Fahrenheit—about the same as your freezer at home—but it's much bigger. It holds about 600,000 accessions, or seed samples. Each one has about 3,000 individual seeds, and each and every one of them was dried out before it was frozen. Some of the 1.8 billion total seeds stored in this freezer, like wheat and pea, can last 400 years. Other seeds, like lettuce and onion, might survive for only a century. Bar codes on the seed packages obscure the exact contents within—a heightened security measure put in place after 9/11. A second vault about the same size sits mostly empty, waiting for more seeds to store.

However, because water and temperature impact the shelf life of seeds differently, depending on the species, and because some genetic material (vegetative cuttings and certain types of seeds) can't survive the drying and freezing process, there's another room with slightly more advanced machinery: 56 cryogenic vats. These are quite a bit cooler than anything found in most homes; they are kept at minus 320 degrees Fahrenheit and store germplasm seeped in liquid nitrogen. *Germplasm* is a broad term that encompasses any living plant tissue that contains the genetic information for a given plant type and can therefore be used for breeding. Germplasm can be seeds, but it can also be leaves, stems, pollen or even just a few cells. The cryopreservation process frees this germplasm of pathogens and buys the material an estimated couple-thousand years of viability.

The NCGRP receives between 12,000 and 18,000 plant samples a year. Some are from international agricultural research organizations and private agribusinesses, but most are from the roughly 30 repositories of the

National Plant Germplasm System. At these active sites, crop species experts evaluate, grow and distribute germplasm to researchers, professors and breeders worldwide. For example, at the Wolfskill Experimental Orchards in the farmland of Winters, California, researchers with the National Clonal Germplasm Repository grow peaches, plums, nectarines, apricots, almonds, prunes, walnuts, pistachios, persimmons, olives, pomegranates, figs and kiwifruit. They also do their own breeding; researchers at Wolfskill are currently crossbreeding wild walnut seedlings to produce offspring with natural disease resistance, which cuts down on pesticide use. The nation's active sites get an average of 8,700 requests to access their stocks annually, according to Peter Bretting, who oversees the system. But a good chunk of their work is funneled back to Colorado, into the Fort Knox of gene banks.

Walters doesn't particularly like the term *gene bank*; she prefers *gene library*. Her point is that this isn't a collection built only for postapocalyptic withdrawals; it is meant to be useful *now*. "The

materials on the shelf contain valuable information about genetic diversity and nature's strategies for combating pathogens, pests, drought," she says. "The information in a public library, such as ours, is freely available."

In this analogy, a researcher who is working through a problem pulls out a volume—an accession—off the shelf and digs through it for genetic information that might lead to a solution. For example, when potato late blight—the plant disease behind Ireland's Great Famine of the mid-1800s—was found in the U.S. in the early 1990s, researchers used plant germplasm from the USDA collection to locate genetic resistance to the pathogen in a relative of a wild potato that originated in central Mexico. About a decade ago, the USDA's Agricultural Research Service released the first blight-resistant potato, named the Defender. Case closed.

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**the impact from a 2,500-**  
**pound object hurled**  
**at 125 miles per hour.**



Not so fast: In agriculture, a new challenge inevitably presents itself. The cycle repeats. "Dealing with the next problem is the story of agriculture, and fixing those problems before they cause famine is the story of agricultural research," Walters says. "Our mission is to stay a couple of steps ahead of the problem. We have the knowledge and the 'spare parts' to be constantly upgrading our crops."

### CITRUS APOCALYPSE

**In 1970**, leaf blight—stimulated by unusually warm and moist conditions—ravaged the American Corn Belt. Plant breeders had created a hybrid corn seed that was incredibly high-yielding, but it turned out to be particularly susceptible to the fungus that causes leaf blight. At least 80 percent of the hybrid corn growing in the U.S. ended up being affected. Because

**AGRO-TECH:** At the NCGRP, scientists do cutting-edge research on crop diversity (top), and maintain one of the world's largest collections of genetic material in freezers and cryogenic vats (bottom).

the agricultural industry had gone all-in on this particular corn cultivar, the disease was economically devastating: The industry had lost an estimated \$1 billion by the time leaf blight was curbed.

Go back a bit further, and there are even more catastrophic examples of what can happen when we neglect to grow a diverse range of crops. In the 1800s, farmers in Ireland planted one variety of potato called the Lumper, which grows on small plots in even the worst soils. By 1845, much of the population—mainly poor people and tenant farmers—depended on a potato-heavy diet. But the Lumper potatoes were genetically identical, which allowed blight to destroy this undiversified crop and trigger the Great Famine that killed more than a million people and prompted at least another million to emigrate.

It's not clear that we've learned from our mistakes. Over the last century, 75 percent of crop genetic diversity has been lost, according to a 2010 report from the U.N. Food and Agriculture Organization. Today, however, if some dreaded disease springs up to wipe out a key crop, we have a backup: the Fort Knox of gene banks. Consider the threats facing the citrus industry today.

In 1919, fruit growers in southern China noticed a mysterious condition ravaging their citrus trees. Then it spread to the Philippines and South Africa. Over the next few decades, scientists offered up possible causes—a zinc deficiency or mineral toxicity, neither correct—as the disease manifested in Thailand and India. Finally, in 1995, the International Organization of Citrus Virologists officially named this bacterial infection: Huanglongbing (HLB).

The Asian citrus psyllid, a tiny insect hungry for the leaves and stems of citrus trees, spreads the disease through its saliva. HLB was devastating to China's citrus trees; infected grapefruits, oranges, lemons, pummelos all decline within several years, their roots decayed, their growth stunted, their leaves turned blotchy and mottled,

and their fruit misshapen and inedible. The fruit's tendency to become green after ripening gave the disease its nickname, citrus greening.

In 2004, scientists discovered HLB in Florida—one of the hubs of the U.S. commercial citrus industry, along with California. These two states produce nearly all the nation's citrus. The crop was valued at \$3.4 billion in 2012, the year that HLB surfaced on a single lemon-pummelo

tree in a residential yard in a new place: Los Angeles County. Today, experts believe this disease poses the greatest threat ever faced by the world's citrus industry. Roughly \$23 million in federal money was awarded in 2014 to four universities to find solutions, such as developing HLB-resistant cultivars or creating a new antimicrobial treatment. In February 2015, Secretary of Agriculture Tom Vilsack announced an additional \$30 million in funding for 22 projects to combat HLB.

Because of the unrelenting nature of HLB, backing up healthy citrus genetic material for future use by growers is critical. That's where the Fort Knox of gene banks comes into play. About five years ago, Gayle Volk, a plant physiologist at the NCGRP, began working on a technique to preserve citrus germplasm. This fruit crop has characteristics that make it especially hard to maintain. Sometimes, the seeds could be dried out and preserved just fine; other times, they would die during the water removal process. Normal cryopreserving processes had unpredictable results as well.

Volk modified standard cryopreservation procedures to pioneer a new way to preserve the desired cultivars. Citrus samples are sent from the USDA active site collection in Riverside, California. When they arrive in Colorado, Volk's team cuts 1-millimeter shoot tips off young branches and then cryopreserves them. If they need to recover the cryopreserved materials, they thaw the tiny shoot tips and micrograft them onto rootstocks. Scientists have cryopreserved more than 100 citrus cultivars this way. So while the disease remains a problem, the backup collection does not. For now, these cultivars are staying put in the NCGRP vaults. But if HLB spreads, Big Citrus might be giving Colorado a call.

## CLIMATE'S KNOWN UNKNOWNs

If HLB does appear in more places, it might be because of climate change. Though it's counterintuitive, the drier grounds that result from a warmer climate are more susceptible to floods when it does rain, and those floods damage crops, carry away fertile topsoil and facilitate the spread of diseases. "Winters may be less harsh, and pathogens may survive winter conditions and cause more crop damage," adds Volk. "With a changing climate, there will be a need for countries to access materials that are available elsewhere that may be better adapted to alternative climates."

Those aren't the only challenges climate change will create for the



**BACKUP:** Scientists are preserving citrus germplasm in case citrus greening disease wipes out whole cultivars.

global food supply. There are also the more pronounced or frequent droughts; crops in California's Central Valley—one of the most productive agricultural regions in the world—are struggling to grow in salty soil as farmers over-pump salinated groundwater to compensate for a historic drought. There's ocean acidification, which occurs when water absorbs carbon dioxide and changes the ocean's chemistry, forcing marine life to adapt or perish. Then there is our livestock. Natural selection has created differences in DNA associated with traits that influence an animal's ability to cope with climate stresses: They possess varying levels of "heat shock proteins" in their bodies, which play a vital role in normal cell function and allow some to perform better in the heat and others to succeed in the cold. If a region begins to experience a changing climate, it could seriously impact the cattle industry there.

Luckily, that's another problem for which the NCGRP has a solution. Harvey Blackburn is an animal geneticist who leads the center's Animal Genetic Resources Preservation Research Unit, which maintains the NCGRP's collection of 800,000 samples—semen, embryos, ovaries, testes, blood—from 25,000 different animals. If disease or climate ravishes an animal population, scientists can provide the resources to reintroduce the preferable genetics.

Recently, his unit was called on to develop a technique to cryopreserve and transplant chicken ovaries. Because today's commercial poultry is sourced from only a few breeders, the genetic diversity of chickens has been dangerously narrowed. Usually, the way to hedge against the potential dangers of genetic uniformity is to freeze sperm for future use, but that doesn't work for chickens. Semen can be used to breed egg-laying hens; but after those chicks hatch, they take about a year to become sexually mature and carry only

50 percent of the desired genetics to

**A DEHYDRATED plant  
is dead biomatter.  
Dry out a person?  
She's a goner. But  
seeds outlast us all.**

re-establish a particular line of poultry. These hens are then bred, and their chicks will have 75 percent of the genetics. Those chicks need another year to sexually mature. The process drags on for three to five years. So Blackburn's team pioneered a way to cryopreserve ovaries from a diverse range of chicken breeds. Now, Blackburn's unit can increase the speed with which a struggling poultry population can be reconstituted to within one year—all they need to do is thaw them out and transplant them into some healthy chicks.

Gene banks respond to problems like this all the time. But their collections also face significant threats. A typhoon in 2006 damaged the national gene bank of the Philippines. Scientists there requested material from the NCGRP to get back on track. In 2012, the International Center for Agricultural Research in Dry Areas (ICARDA), a gene bank in Aleppo, Syria, was forced to abandon its headquarters in the early days of the current civil war. ICARDA moved to Beirut, but much of its collection was damaged in the process. In September this year, ICARDA made an unprecedented request: a withdrawal from the doomsday Svalbard Global Seed Vault, embedded in the Arctic permafrost of a remote Norwegian archipelago, whose contents, nearly 865,000 seed samples, are supposed to remain untouched until absolutely necessary. Svalbard sent ICARDA samples of wheat, barley and grasses suited for dry regions to restart their war-torn collection.

In other words, gene banks—like the world's agricultures—are not self-sufficient. The good news is that gene banks have proliferated in the past decade. There are now roughly 1,750 worldwide, and the number of samples has grown to 7.4 million. In large part, this is thanks to the International Treaty on Plant Genetic Resources for Food and Agriculture. Better known as the Seed Treaty, this agreement ensures that farmers, plant breeders and scientists worldwide can easily share seeds and genetic materials. The European Union and 134 other nations, including the U.S., have ratified the agreement. The treaty has created a vast network that, in theory, allows for experts all over the world to develop climate-smart agriculture and heighten global food security. The Fort Knox of food is at the center of this international web. It has one of the largest collections of any gene bank in the world, housing at least 10 percent of the worldwide material, and is one of the few that makes its library freely and readily available to anyone. But it's also unique in that it facilitates some of the most essential agro-research taking place today. In addition to the citrus project, Volk and her colleagues at the NCGRP have developed methods for preserving germplasm for garlic, sugar cane and Jerusalem artichokes, and they are now working on a method for grapes.

Despite the success of their work, gene banking faces serious financial threats. The NCGRP has an annual budget of only \$4.8 million, and there are very few funds or mechanisms to keep the global library fully stocked.

In 2016, the Global Crop Diversity Trust, the international body that manages Svalbard, will launch a campaign to raise \$850 million for an endowment.

Help might be on the way, though, thanks to the global mobilization to fight climate change. When world leaders meet at the end of November in Paris for the U.N.'s 21st Conference of the Parties, one of the key agenda items will be financing the Green Climate Fund with \$100 billion a year to help developing countries cope with climate change. Some of that money will go to clean energy infrastructure; lots of it will go to resilience projects. But many, including philanthropist Bill Gates, have begun to call on global leaders to earmark a good chunk of that money to help those most likely to suffer from climate change: small farmers.

If the money starts to flow in that direction, it might very well end up funding crop diversity projects. Research to make crop seeds more drought-tolerant and productive is "mind-blowingly underfunded," Gates said. One organization that does this type of research is the Consultative Group for International Agricultural Research, which is intimately connected with the global gene bank network.

The best news, though, is that after many years of ignoring the crisis, politicians and policymakers are starting to realize how quickly climate change could threaten our ability to feed ourselves. "We cannot have food security if farmers and fishers around the world are having a more difficult time growing crops, catching fish, raising livestock," said U.S. Secretary of State John Kerry at Expo 2015, held this past October in Milan, where the central question was how to feed the planet. The answer may very well be found in our libraries, the ones with the vast stores of genetic information. 



**DOWN A CORN HOLE:** Because industrial farms grew only one cultivar of high-yielding corn in the first half of the century, when disease hit in 1970, it hit extra hard.

# RETURN OF THE DICTATORS



THE HOPES OF THE ARAB SPRING ARE DASHED, AND EGYPT IS AGAIN SETTING THE STANDARD FOR OPPRESSION IN THE REGION

BY JANINE DI GIOVANNI,  
WITH ADDITIONAL REPORTING  
BY NOAH GOLDBERG



**MIGHT IS RIGHT:**  
With the massacre  
of nearly 1,000  
protesters in 2013,  
Egyptian security  
forces made clear  
what would happen  
to those who chal-  
lenge President Ab-  
del-Fattah el-Sissi.

# AT

**THE ANNUAL MANAMA DIALOGUE** in Bahrain, an elite Middle East security summit held in late October, the keynote speaker was Egyptian President Abdel-Fattah el-Sissi. Surrounded by a phalanx of bodyguards, General el-Sissi took the stage and addressed a packed audience of ministers, diplomats and senior U.S. State Department officials. He talked of Egypt's role in the conflicts in Syria, Yemen and Libya.

But the general's main concern—as a staunch military man who has been in the army since the age of 23—was the rise of armed factions in the Middle East. "We are concerned by the undoing of the national state and the rule of law by armed militias," el-Sissi emphasized at the gathering, just days before a Russian passenger plane went down in the Sinai Desert in what increasingly looks like a bombing by the Islamic State militant group (ISIS).

After being lauded at Manama, where he met with the German minister of defense and other bigwigs, el-Sissi flew home to take stock of the Russian airline crisis and to prepare for an official visit to Britain, where he would meet with Prime Minister David Cameron. After a period when the West was cautious about his ascent to power, el-Sissi's visit underlined the fact that he is firmly back at international diplomacy's top table, just weeks after Egypt was elected to the U.N. Security Council.

As British human rights groups were protesting el-Sissi's arrival, he told the BBC that democracy in Egypt is a "work



in progress." An optimist might say the same of the whole region. A pessimist would say the trend is in the opposite direction: not more democracy but less.

Four years ago, the outlook was very different. In 2011, a trader in Tunisia set himself on fire to protest harassment by a municipal official, sparking outrage from his fellow Tunisians and protests across the region that kicked off the Arab Spring. As young Arabs took to the streets to demand freedom, there were high hopes that democracy would take hold in countries long ruled by dictators and authoritarian royal families. The 2015 Nobel Peace Prize was awarded to a collection of democracy activists in Tunisia. But to many, that looked like a desperate attempt to keep the one relatively democratic country in the region on track as its neighbors sank back into dictatorship. Egypt, above all, has disappointed those who dreamed of Arab democracy.

"If I had to mark the definitive end of the Arab Spring, it would be July 3, 2013," says Shadi Hamid, a senior fellow at the Brookings Institution, speaking of the day el-Sissi used the military to topple the democratically elected Mohammed Morsi and other Muslim Brotherhood leaders who had come to power through the ballot box after the Arab Spring. "When people saw the Egypt experiment failing, it had a chilling effect. It was not just about Egypt but about other autocrats playing an aggressive role in their countries."

El-Sissi's administration quickly banned protests. A month after the coup, Egyptian security forces killed nearly 1,000 protesters, most of them unarmed, in Rabaa Square. Human Rights Watch called it "one of the world's largest killings of demonstrators in a single day in recent history."

+

**LISTEN UP:** In Manama, el-Sissi said "militias are challenging states in the region," and warned against being taken in by "movements that employ religion for political goals."



**MASSACRE:** Soon after Mohammed Morsi was ousted in 2013, his supporters gathered in Cairo's Rabaa Square to demand his return. Security forces responded forcefully, killing nearly 1,000 people and injuring many more.

Since 2013, el-Sissi has launched the toughest crackdown on Islamists in Egypt's history.

"Sissi fits the classic case of a dictator," says Jane Kinninmont, a senior research fellow at London think tank Chatham House, citing the large number of political prisoners, the ability to "disappear people" with impunity and the protesters massacred in the streets in 2013. "They hold elections, but these days there are very few dictators who don't hold elections."

**IT'S NOT JUST EGYPT.** With the notable exception of Tunisia—and even there, democracy remains vulnerable, and large numbers of disaffected young men are signing up with ISIS—the Arab Spring countries have found it difficult to make the transition to a stable, more democratic system.

Syrians have endured the most suffering. A popular uprising became a civil war that descended into a bloody stalemate, with a confusing mix of rebel groups overshadowed by ISIS, and Russia

FROM LEFT: HASAN JAMAL/AP; MOSSAAB ELSHAMY/GETTY (2); PREVIOUS SPREAD: SCOTT NELSON/REDUX

## "THESE DAYS THERE ARE VERY FEW DICTATORS WHO DON'T HOLD ELECTIONS."

intervening on behalf of President Bashar al-Assad to bring further destruction through airstrikes. There is no end in sight, and Assad may yet manage to cling to power.

For the West, Libya was the other great hope, so much so that NATO intervened in 2011 to help rebels get rid of Muammar el-Qaddafi. But with the Libyan leader gone, the country fell into chaos, and Islamist militants flourished. Two rival factions claim to govern Libya—an internationally recognized government that has been banished to the eastern city of Tobruk and an alternative administration in the capital, Tripoli. As the United Nations seeks to broker a national unity government in Libya, the one man who looks increasingly powerful is General Khalifa Hifter. He has taken command of military operations against Libya's Muslim Brotherhood and other militant groups, winning the parliament's backing to "fight terrorism" throughout the country.

Hifter has shifted his loyalties over the years. He supported the 1969 coup that toppled the old monarchy and brought Qaddafi to power. He then turned anti-Qaddafi and reportedly was trained by U.S. intelligence officers in an attempt to oust



his former ally. During the Libyan revolution, he left his home in Northern Virginia to join the anti-Qaddafi forces, fighting alongside many of the militia leaders he is now attacking.

Hifter is following the Egyptian model, mimicking el-Sissi by casting all Islamists as evil, promising to crush the militias in the country's eastern portion and stressing the need to repress them to create order. "One of his calling cards is a sense of uncertainty," says the Brookings Institution's Hamid. "He is really drawing on this perception of the disintegration of order. All the strongmen

**HOPE AND CHAOS:** General Khalifa Hifter, above, is gaining influence in Libya where rival factions have been feuding for years. Below, Bahrain saw protests for democracy in 2011, but authorities quickly clamped down on dissent.

+



## "PEOPLE DON'T HAVE A GREAT DEAL OF CHOICE TODAY—THEY SEE IT AS A CHOICE BETWEEN A MILITARY REGIME OR AN ISLAMIC ONE."

are saying, 'Look what the Arab Spring has done.'"

Farther west in North Africa, Morocco is also a cause for concern. While it has a written constitution, it is a monarchy with no separation of powers—political, economic and religious power are all concentrated in the Royal Palace in Rabat. While King Mohammed VI has implemented some reforms since he came to power in 1999, none of them are democratic. Arab Spring-era street protests there lost momentum, partly due to a crackdown by police, and the government has since made no moves toward greater freedom. "Democratization in Morocco is a two-way street, and right now the country is moving backwards," states a recent report on the nonprofit website Open Democracy.

On the Arabian Peninsula, things are no better. Gulf monarchies and their security forces ensured that the Arab Spring had little impact there, except in Bahrain, which has long experienced sectarian tensions since it has an estimated 60 percent Shiite majority but is ruled by the Sunni al-Khalifa monarchy. But pro-democracy protests in 2011 were crushed quickly and effectively, with the help of neighboring Saudi Arabia.

America's alliance with Bahrain, where the U.S. Navy has a vital base for its operations in the region, illustrates Washington's

long-standing policy in the Middle East of putting pragmatism over idealism. “[President Barack] Obama has been silent about Bahrain,” says Chatham House’s Kinninmont. “It has become much more repressive. They don’t pretend to be a democracy. They openly say democracy would not be appropriate in their part of the world.”

Saudi Arabia, too, has long been one of Washington’s closest allies, regardless of its human rights record, and Western governments seem to have accepted that they need to make similar accommodations for el-Sissi. In the spring, the Obama administration restored the military aid to Egypt that had been suspended after Morsi was deposed. The main reason for renewing aid, Obama said, was the urgent need to fund anti-ISIS governments in the region. Europe is also warming up to el-Sissi, with France increasing arms sales to Egypt.

Kenneth Roth, executive director of Human Rights Watch, calls this “the lionization of the new pharaoh” and says el-Sissi symbolizes not just the return of the Arab dictator but also “the intensification of it. Sissi’s repression is worse than [former President Hosni] Mubarak ever was, and the West’s response of embracing him has been abysmal.”

**EL-SISSI HAS SAID** that democracy cannot be achieved swiftly in Egypt and that it takes years to build institutions that support it. “Democracy is about will and practice,” he explains.

Plenty of people both inside and outside the region have concluded that democracy as enjoyed in the West is not the right fit for the Arab world. Saudi academic Majed bin Abdulaziz al-Turki of Riyadh’s Center for Media and Arab-Russian Studies argues that it is wrong for Western countries to impose their views—on topics such as rights for women and minorities—on countries that do not want them. He labels such attempts “colonial.”

Kinninmont says part of el-Sissi’s appeal is that he has cast himself into the role of national protector and fighter against global terrorism, a tactic used by other authoritarian leaders such as Russia’s Vladimir Putin, Syria’s Assad and Turkey’s Recep Tayyip Erdogan, as well as the Saudi and Qatari monarchs. “Some people would rather have security and be able to see their families live safely than have democracy,” she says. “But that is not a cultural issue. It’s a human issue.”

More than a decade of chaos and sectarian violence in Iraq since U.S.-led forces ousted Saddam Hussein has only deepened that impulse. “There is a long tradition of totalitarianism in the Arab world for many reasons,” says Emmanuel Karagiannis of King’s College London. Countries that were historically tribal and feudal societies have perpetuated the rule of dictators and kings through state control over the media, the judiciary and security forces, as well as the oppression of women. Corruption and cronyism have flourished, and the military is generally the most powerful institution in such societies.

“Also important is that many state-controlled economies only support certain sectors that do not produce a middle class,” Karagiannis says. “If you don’t have a middle class, you don’t have democracy.”

However much human rights groups complain, non-Arab observers are in a tough position when it comes to promoting democracy. Karagiannis says it can be dangerous for activists to



**SO HELP ME, GENERAL:** Supporters of el-Sissi credit him with restoring order and defending the country against Islamist extremists, particularly the Muslim Brotherhood.

accept help from the West because they can then be tarred as Western spies. Democratic change, if it comes, must come from within, he insists. “The seeds of democracy were planted by the Arab Spring,” he says. “It changed everything—there is no way back. But the only way to support these brave people is to support them morally but not financially.”

El-Sissi’s popularity in Egypt is hard to judge. Polls indicate the army is respected and he is given credit for restoring order. But an accurate rating is difficult to ascertain: Most of the dissidents in the country have been silenced or driven abroad. Journalists are intimidated or imprisoned—most recently, a reporter named Hossam Bahgat was held for several days in November after reporting on the conviction of several members of the military for planning a coup. “It’s a mixed picture,” says Kinninmont of el-Sissi’s public image. “It’s not a ringing endorsement. People don’t have a great deal of choice today—they see it as a choice between a military regime or an Islamic one.”

Now militants linked to ISIS are thought to have brought down the Russian passenger jet that crashed in the Sinai on October 31, killing 224 people. Egyptian security forces have already been battling ISIS militants in the Sinai Desert, and el-Sissi can be expected to ramp up operations against the group after this attack. If his past actions are any guide, he will take the opportunity to crack down even harder on his opponents, and the West will probably do little about it—particularly after the November 13 mass shootings and bombings in Paris that killed at least 129 people.

Says Hamid, “The sad lesson of the Arab Spring—or the crushing of the Arab Spring—is that brute strength works, violence works.”



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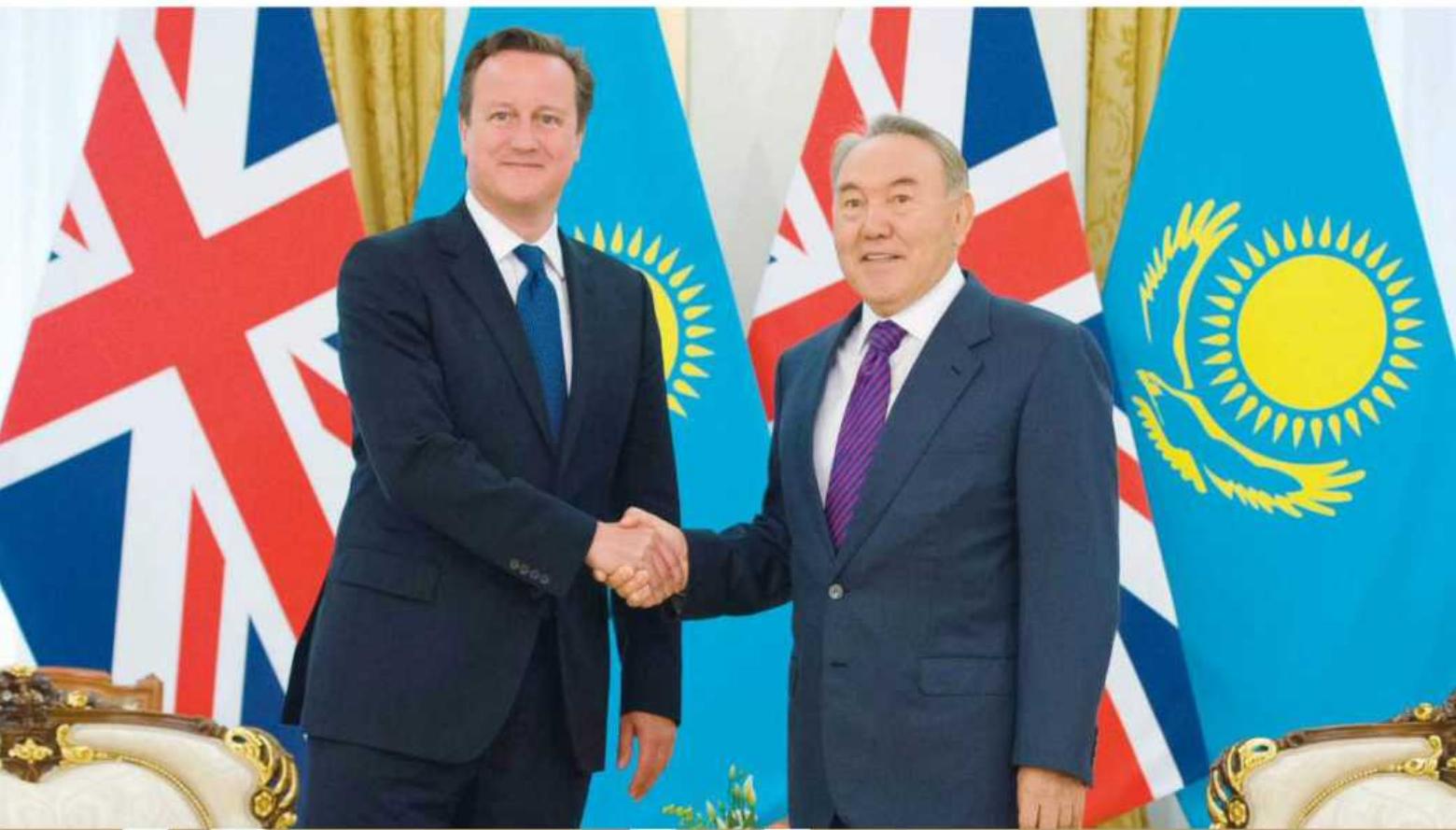
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International



# Kazakhstan

## Closer ties with Europe

**Strategically located between continents, Central Asian resource giant aims to attract billions in foreign investment to sustain spectacular GDP growth**

► ASTANA, KAZAKHSTAN: British Prime Minister David Cameron (L) shakes hands with Kazakhstan President Nursultan Nazarbayev after arriving at the Presidential Palace on July 1, 2013 in Astana, Kazakhstan. Cameron is visiting Kazakhstan as part of a trade mission; the first ever trip to the country by a serving British Prime Minister, after making an unannounced trip to visit troops in Afghanistan and meeting with the Prime Minister of Pakistan in Islamabad. (Photo by Leon Neal - Pool/Getty Images)

In less than a quarter of a century as an independent nation, Kazakhstan has come a long way. Located between Europe and Asia, and sharing a border with five countries including China and Russia, the world's largest landlocked state has posted exponential economic growth, fuelled by plentiful resource riches, and emerged onto the global stage as a major player in Central Asia.

Led by President Nursultan Nazarbayev since 1989, Kazakhstan is on track to become one of the 30 most developed countries worldwide by 2050. Hydrocarbon and mineral reserves should guarantee long-term prosperity, while the Bolashak generation of Kazakhstanis educated abroad are ready to take over key enterprises and manage the future growth sustainably.

From the skyscrapers of the new capital Astana to the ancient trading hub of Almaty on the New Silk Road between China and Europe, Kazakhstan is attracting massive inflows of foreign direct investment from Europe and the US. In early November 2015, President Nazarbayev visited London, where he met with the Queen and Prime Minister David Cameron, and signed 40 new trade deals worth €4.25 billion for gas and steel projects.

## Interview with Ambassador to the UK

ERZHAN KAZYKHANOV

**"We have developed a close relationship and strategic partnership with the European Union"**

Formerly Kazakhstan's Ambassador to the United Nations and the Minister of Foreign Affairs until 2012, Erzhan Kazykhanov was appointed Ambassador to the United Kingdom in September 2014. He recently spoke with Economy Survey Corporation about his country's reform agenda at home and relations overseas.



**Erzhan Kazykhanov,**  
Ambassador of  
the Republic of Kazakhstan  
in the United Kingdom

of the economy, [involving] new technologies, transportation, and infrastructure. Fourth is a unified nation. We have a multi-ethnic society. Our asset is our diversity, because we are the only culturally diverse country in Central Asia. And the fifth reform is a responsible and accountable state. We are moving fast. We have a clear understanding that we can fall into the middle-income trap. The goal of the President is to try to overcome this and grow further."

"We are a peace-loving country and maintain friendly relationships with the rest of the world. We attach great importance to our immediate neighbours like Russia, China, and countries of Central Asia. China is one of our biggest trading partners [and] Russia is our ally, but we have an independent economy, an independent policy of engagement with the West. We have developed very close relationships and strategic partnerships with the U.S. and the European Union, and are expanding our cooperation with the Islamic world. We are hosting EXPO-2017. It's the first time in Eurasia, the first time in Kazakhstan, it will be a huge event. We are building the facilities, we expect more than 100 countries to participate, and will welcome five million visitors. [It will be] great exposure for Kazakhstan."



## Investment

# EU members lead the way with capital inflows

**Hydrocarbons, construction, and manufacturing are the most in demand sectors, helped by efforts to cut red tape and offer world-beating fiscal benefits**

**D**espite the global slowdown caused by the slump in crude prices, Kazakhstan remains one of the world's favourite investment destinations. The latest FDI data from the National Bank of Kazakhstan, released in October 2015, revealed that the economy attracted more than €6.8 billion in incoming investments in the first semester of the year, with the lion's share coming from European Union member states like the Netherlands, France, the United Kingdom, and Germany.

While the half-year total is lower than 2014, when the country received in excess of €21.6 billion during the 12-month period, the figures are still very encouraging, with the largest slice of capital destined for oil and gas exploration and production (worth over €3.25 million in total), followed by the construction and engineering industries. The manufacturing sector, particularly metallurgy and steel production, was also a solid performer.

Much of Kazakhstan's success is due to the good offices of the Ministry for Investment and Development and Kaznex Invest, the National Export and Investment Agency, which works under its auspices. The Ministry's remit essentially encompasses the entire economy and its mission, according to Minister Asset Issekeshev, is to slash red tape, streamline policies, and make the country's investment climate as welcoming as possible.

"[We] play a crucial role in the development of the country," Issekeshev asserts. "We have created favourable conditions for investors, as well as setting up free zones, waiving visa requirements for investors, simplifying labour requirements, and abolishing unnecessary rules to make regulations more effective and licenses easier to obtain. This all means investors find ever increasingly profitable possibilities to do business in Kazakhstan."



**Asset Issekeshev,**  
Minister of Investment  
& Development of the  
Republic of Kazakhstan



**Bakhyt T. Sultanov,**  
Minister of Finance  
of the Republic of Kazakhstan

The mining sector is just one example how the Ministry is making life easier for prospective investors. Soviet-era regulations long mired the industry in bureaucracy and delays, the Minister admits, but the introduction of a model based on Australia and Canada's approach has "fundamentally changed the system," he says. "Now interested investors have access to all the relevant information through the internet and participate in open tenders and auctions."

Kaznexus' job is to get the message out there and ensure the nation remains as competitive as possible: "If you look at international ratings, we are doing better than Russia or China," says its Deputy Chairman, Kairat Karmanov. "Registering a company, the ease of paying taxes, the overall tax burden is much lower than in the countries surrounding Kazakhstan. We introduced a new support package last year, offering tax [exemption] to potential investors in priority sectors: 10 years for corporate and social taxes, and eight for property tax. If you invest \$20 million (€18.3 million) or more, you get 30% cashback, which is unprecedented anywhere in the world."

Kazakhstan's strategic location is yet another reason for investors, particularly from the European Union, to explore production and export opportunities to China, Russia, and Central Asia. The New Silk Road Economic Belt has strengthened the national logistics system, priming the country to become a regional business and transportation hub, connecting China to the European Union and tapping into a trade route worth some €550 billion a year. Close to 300 European companies are already present here, Minister Issekeshev confirms.

Other nations whose economies depend heavily on hydrocarbons, including neighbours like Russia, are facing severe budgetary shortfalls. But Minister of Finance Bakhyt T. Sultanov sees the advent of low oil prices as a blessing in disguise, giving the government the perfect opportunity to push through reforms and open up the economy to diversification.

"If there [were] no such crunches, they would have to be invented for Kazakhstan," the Minister points out. "When prices are high, nobody



► Almaty, the country's biggest city, a regional hub for trade and culture, and one of the top 10 fastest-growing financial centres worldwide, according to the 2015 Global Financial Cities Index.

wants change. Everybody thinks it will always be the way it is – oil and gas, mining, and budgetary spending would feed the whole economy."

Thanks to what he calls the "wise decision" to set up Samruk Kazyna, the nation's sovereign wealth fund, in 2000 to bank dividends in good years, Kazakhstan has a comfortable cushion to cover its obligations for quite some time. The fund's balance currently stands at more than €70 billion. Prudent budgetary management has kept spending below the rate of economic growth, avoiding overheating and the spectre of Dutch Disease.

As a result of saving rather than spending, the country was able to weather the financial crisis well, having the wherewithal to pump cash into the financial sector in 2009 and, again, in 2014 without incurring debt: "In difficult situations, we have proven to be flexible," the Minister smiles.

"Our government is strategically moving forward and creating favourable conditions for investors and business development in Kazakhstan," Sultanov insists. "During the last five years, we have launched a major industrialisation program and nearly 800 projects have been implemented. Last year alone, these companies provided a minimum of 1% of overall economic growth."

## Quality guaranteed, from well to wheel



**KMG International is a diversified company owned by Kazakhstan's national oil & gas company, KazMunayGas, with access to vast resources and ambition for further development and expansion. KMG International provides consumers with high-quality products and services, combining a premium design with the best technical solutions. Having core operations in Romania, the Black Sea and Mediterranean basins, KMG International is present on 12 markets on 3 continents.**

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## Almaty

### Former capital focuses on present and future

Nestled in the foothills of the Trans-Ili Alatau mountains, Almaty was Kazakhstan's capital until 1997, when Astana was awarded the status at President Nazarbayev's behest. Home to over 1.5 million people, it remains the country's biggest city, a regional hub for trade and culture, and one of the top 10 fastest-growing financial centres worldwide, according to the 2015 Global Financial Cities Index.

"Almaty plays a very special role for every Kazakhstani," says its Mayor, Bauyrzhan Baibek. "This is where we started the history of independence our ancestors dreamed of for centuries. The city is well known for its liberal views and economic drive. Today, it contributes more than 21% of GDP and a quarter of the country's income."



**Bauyrzhan Baibek,**  
Mayor of Almaty

"The average age of [our] citizens is 37 and one-in-three students lives here," Baibek notes. "Innovations appear where the young and knowledge is concentrated. We have the Kazakh-British Technical University, Kazakh-German University, Kazakh-American University, and KIMEP University, which are very competitive Western-style universities with a pool of successful alumni."

The city is Kazakhstan's most popular destination for business and leisure – "60% of tourists come to Almaty," the Mayor says – and the location of its busiest airport, Almaty International. In 2014, the government outlined plans to raise tourism's share of GDP to 3% by 2020 and in July last year, extended its 15-day visa-free programme to 19 countries, including many in the European Union.

Almaty will host the 28th Winter Universiade in 2017, bringing student athletes from around the world to compete for gold in 11 disciplines. Kazakhstan is investing €870 million – to build an ice palace, skating rink, an athletic village, and a new airport terminal for the games – but will be making use of the city and region's existing facilities to keep the cost of the event to a minimum: "Since we organized the Winter Asian games [in 2011], we already have good infrastructure for skiing, snowboarding, and ski jumping," Mayor Baibek notes. ■



## Finance

### Strategic merger creates financial powerhouse

**Kazkommertsbank looks to follow a successful takeover with transformative growth strategy**

**T**he financial crisis hit Kazakhstan's banking sector hard. According to a 2014 IMF analysis, the industry fell victim to its own success, as unsustainable growth led to high-risk lending by overleveraged institutions. Although the state shored up three banks and prevented systemic collapse in 2009, non-performing loan portfolios still impact on profitability, compounded by recent devaluations of the tenge.

The country's largest lender by assets and a leading player in the CIS region, Kazkommertsbank (KKB), has not been immune to the challenges faced by the industry. But, following an €850 million deal to buy rival BTA Bank in February 2014 and the acquisition of almost 57% of its stock that August by Kenges Rakishev, one of Kazakhstan's wealthiest businessmen, KKB is in much better shape to return to profit soon.

Rakishev started out in 2000 as a start-up investor in Sat&Co, which diversified from trading into construction before concentrating on the mining sector. Today, it acts as a management company for 30 subsidiaries, active across the minerals and metals sectors. In the meantime, Rakishev created a venture capital fund for tech investments, before buying out a private equity group to gain majority control of KKB.

"My investment in Kazkommertsbank can be considered a strategic one," Rakishev explains. "I strongly believe the bank has potential in the financial sector, where it is already a leader in its field. It has a good track record and a long history; it has always been one of the real independent banks in Kazakhstan. I think [it] has a great future and we are currently transforming it with a new strategy over the coming two to three years."

This includes finalising the merger with BTA in just 12 months, actively pursuing non-performing loans, and focusing on economies of scale, efficiency, and product excellence in the domestic marketplace, according to Magzhan Auezov, who was named KKB's CEO in March 2015.

"We have the retail bank with the largest market share in deposits and an extremely strong presence in card and electronic channels," Auezov says. "The next step is to enrich our product line, sell more, and maintain the strength of both institutions. [Our] corporate business is a leading player in the market, we have an investment and securities arm that has led major transactions, and are a very active lender."

Kazkommertsbank is bullish about prospects for the Astana International Finance Centre, announced at the Astana Economic Forum this May: "It is a fascinating idea," Auezov believes. "If we have an English-law based financial centre, this would become an entirely new concept not just for Kazakhstan, but for the entire region." ■



**Kenges Rakishev,**  
majority shareholder,  
Kazkommertsbank



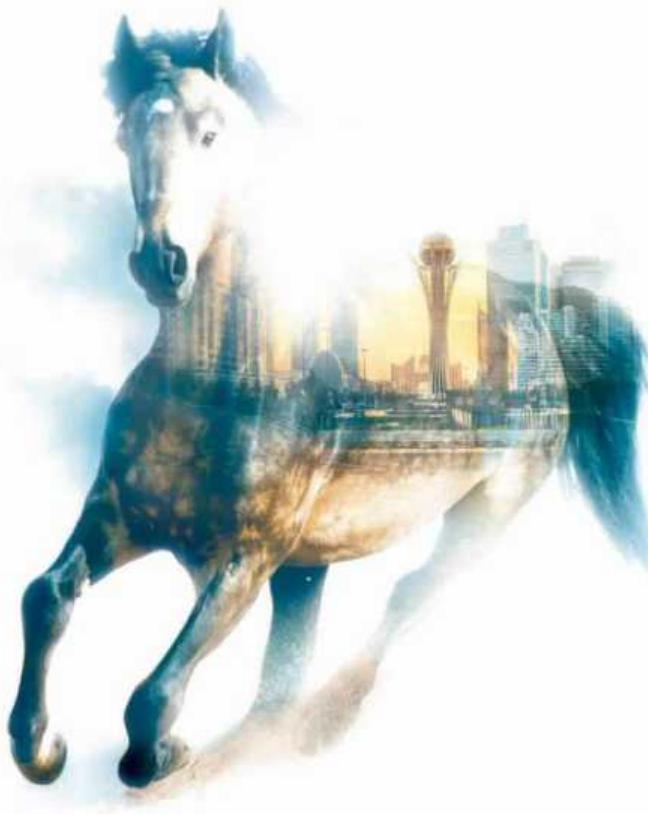
**Magzhan Auezov,**  
CEO, Kazkommertsbank

## LEADING THE RACE



Since the birth of Kazakhstan as an independent nation, Kazkommeratsbank has grown and developed along with its country. Throughout our 24 years of mutual history we've shared our triumphs and our challenges, striving to bring wealth and prosperity to the people of Kazakhstan.

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## Energy and economic diversification

# From resource riches to long-term prosperity

Despite oil-price fluctuations, Kazakhstan embarks on major drive to diversify



**A**ccording to the US Energy Information Administration's 2015 energy data analysis, citing Oil and Gas Journal among other sources, at the start of 2014 Kazakhstan possessed proven reserves of 30 billion barrels of crude oil, 85 trillion cubic feet of natural gas, and over 37 billion short tons of recoverable coal, respectively ranking it 12th, 18th and 10th worldwide.

The country's latest reports for the Extractive Industries Transparency Initiative revealed natural resource revenues reached nearly €27.5 billion in 2012 and 2013, with hydrocarbons accounting for 93% of the total and 70% of exports. In 2013, the country produced 570 barrels of oil, 1.4 trillion cubic feet of gas, and 100 million tons of coal, not to mention 20 tonnes of uranium. It's safe to say energy is big business in Kazakhstan.

Although plummeting oil prices since August 2014 have put a significant dent into foreign-exchange earnings, the government has long been conscious of the risk of such an eventuality and is well prepared for prices to remain low for the foreseeable future: "Whereas forecasts differ widely, we are predicting this period to last anything from two to five years," Minister of Energy Vladimir Shkolnik says. "Kazakhstan is ready to undergo significant change and we do not adapt our energy policy simply to current prices."

### ENORMOUS DEVELOPMENT POTENTIAL

"Low prices mean oil companies reconsider and refocus their projects for expansion," admits Timur Kulibayev, the Chairman of KazEnergy, the of industry association that groups together 80 players in the sector, "[but] the development potential of Kazakhstan is and remains obvious. The role the country plays in the global energy scenario increases year by year. Investment potential is enormous and concerns not only production, but also refinery, services for the industry, and the production of goods."



Vladimir Shkolnik,  
Minister of Energy  
of the Republic of Kazakhstan

By the end of 2014, Kazakhstan had quadrupled oil production to more than 80 million tons, equivalent to 1.64 million barrels a day, since 1991 and is on track to reach 140 million, Kulibayev says, once new projects at the offshore Kashagan oilfield in the Caspian Sea and the onshore Tengiz field – where a consortium led by Chevron is close to investing more than €31 billion – come on stream.

The national oil and gas company, KazMunayGas (KMG), looks after Kazakhstan's interests in the oil and gas sector, from exploration and production to refining and distribution. The National Fund currently controls 90% of its stock, with the rest held by the central bank, but, in October 2015, it was included on a list of state-owned concerns to be put on the block for privatisation. At least 25% of its shares are slated to be sold off within the next four years, but that should not affect KMG's or the country's ambitions.

"Our strategic goal is to produce 35 million tons by 2025, a significant growth from our current 22 million tons," says Daniyar Berlibayev, the Deputy Chairman of the Board for Corporate Development. "We are not revising our declared target to enter the world's top 30 oil producers. We have focused on raising efficiency and [reducing] capital expenditure across our entire investment portfolio. This allows us, even in a low-price environment, to plan for further profitability."

KMG International, the group's overseas arm, acquired 75% of Romania's second-largest oil company, Rompetrol, back in 2007 and purchased the remaining shares in 2009. This gave it access to what Berlibayev calls the "most modern refinery complex on the Black Sea", to which it exports crude from Kazakhstan's fields before selling refined products on to European customers, via its own-brand chain of 1,000 service stations. "When oil prices are dropping," he points out, "our refining profitability margin is growing, serving as a natural hedge."



Timur Kulibayev,  
Chairman  
KazEnergy

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RSE NC CPMRM RK ensures sustainable development of mining and metals production sector of Kazakhstan. Main directions of activity are aimed at system solution of problems in all stages of mining and metallurgical cycle: from mining, dressing, processing to produce of final products.

[www.cmrp.kz](http://www.cmrp.kz)

National Center on Complex Processing of Mineral Raw Material of the Republic of Kazakhstan

## Sembol Construction Company

"Kazakhstan is growing, economically the country is doing well"

Headquartered in Turkey and active in Croatia, Libya, Ukraine and the UAE, Sembol Construction Company (SML) is a design, construction, and project management company and the name behind some of the most impressive architecture in Kazakhstan in recent years. These include three Norman Foster-designed buildings in Astana: the pyramidal Palace of Peace and Reconciliation; the Nazarbayev Centre cultural complex, which resembles an eye gazing skyward, and Khan Shatyr Entertainment Centre, a transparent, 150-metre-high tent.



**Daniyar Berlibayev,**  
Deputy Chairman of the Board  
for Corporate Development,  
KazMunayGas



**Prof. Abdurasul Zharmenov,**  
Director General, National  
Centre on Complex Processing  
of Mineral Raw Material

### TRANSFORMING THE ECONOMY

Created in 2008, the sovereign wealth fund, Samruk Kazyna, is a vital element of the strategy, setting aside windfall profits to protect the economy from shocks and support the state's diversification plans. Leveraging its ownership of state interests in some of Kazakhstan's biggest companies, it is becoming a more active investor and rolling out a Transformation Programme and restructuring enterprises to create value, yield dividends, and expand its asset base.

"[Our] current investment portfolio enables growth in traditional industries," Umirzak Shukuyev, the fund's Chairman, explains. "For the long-term, it is necessary to implement projects in new sectors, such as environmentally focused energy, industrial and transport infrastructure, [and] processing of raw materials. These new promising industries will be the basis for future economic growth."

Founded in 2013, Baiterek is another state-owned holding company, created to complement the work of the National Fund: "Samruk Kazyna is more commercial and market-oriented; you could say they have to earn money, whereas we have to spend wisely," notes its Chairman Kuandyk Bishambayev. "We are more focused on establishing financial growth in priority sectors, related to industrialization, diversification, and innovation."

Run as a commercial operation, Baiterek's mission to stimulate investment by facilitating backing and long-term financing from the state, in response to private-sector initiatives: "What sometimes keeps investors from certain countries is finding the right partner," Bishambayev explains. "We basically offer the investor to partner with the government, without having to deal with government procedures, which is a major advantage."

"The most challenging was Khan Shatyr," recalls Fettah Tamincé, SML's President. "The building itself is very unique; a lot of materials were used for the first time. Constructing, let's call it, the biggest tent in the world, on such flat land, where you have high winds and very tough weather conditions, we had to redesign many things. At the time, even the road [Turan Avenue] was not there."

Founded in 2000, SML has been in Kazakhstan since 2004, when it built its first hotel (see accompanying article) and intends to continue expanding its interests nationwide: "Kazakhstan is growing, economically the country is doing well," Tamincé says. "I have witnessed all the good things happening for the last ten years. That's why I'm looking to other cities, like those close to the oilfields: Atyrau, Aktau, Aktobe... We [want] be present in almost every big town in Kazakhstan."

### Mining

Kazakhstani know-how adds value to metals

Fossil fuels are not the only natural resource Kazakhstan has in abundance. Its 2.7 million square miles of territory – larger than France, Germany, Spain, and the United Kingdom combined – holds huge deposits of metals such as lead (of which it possesses 15% of the world's known reserves), zinc (17%), copper (6%), chromium (21%), and gold (20%), and an array of in-demand minerals and rare earths. According to a 2014 report by Business Monitor, the national mining industry should be worth close to €27.5 billion by 2017.

The country does merely extract and export raw materials, but has developed expertise in transforming them. Dr Abdurasul Zharmenov, the Director General of the National Centre on Complex Processing of Mineral Raw Material (CMRP), says the CMRP is working with Germany's ThyssenKrupp on a joint project for ferro-silica alloys and has even come up with a way to extract aluminium-free ferrosilicium from rice husks, a by-product of the globe's most ubiquitous foodstuff.

### Tourism

Off-beat attractions, off the beaten track

According to the World Bank's latest data on tourism arrivals, Kazakhstan welcomed more than 4.9 million visitors from overseas in 2013. Business travellers aside, who account for a sizeable share of those coming and going, the country has a host of natural and man-made attractions sure to appeal to those who prefer the road less travelled.

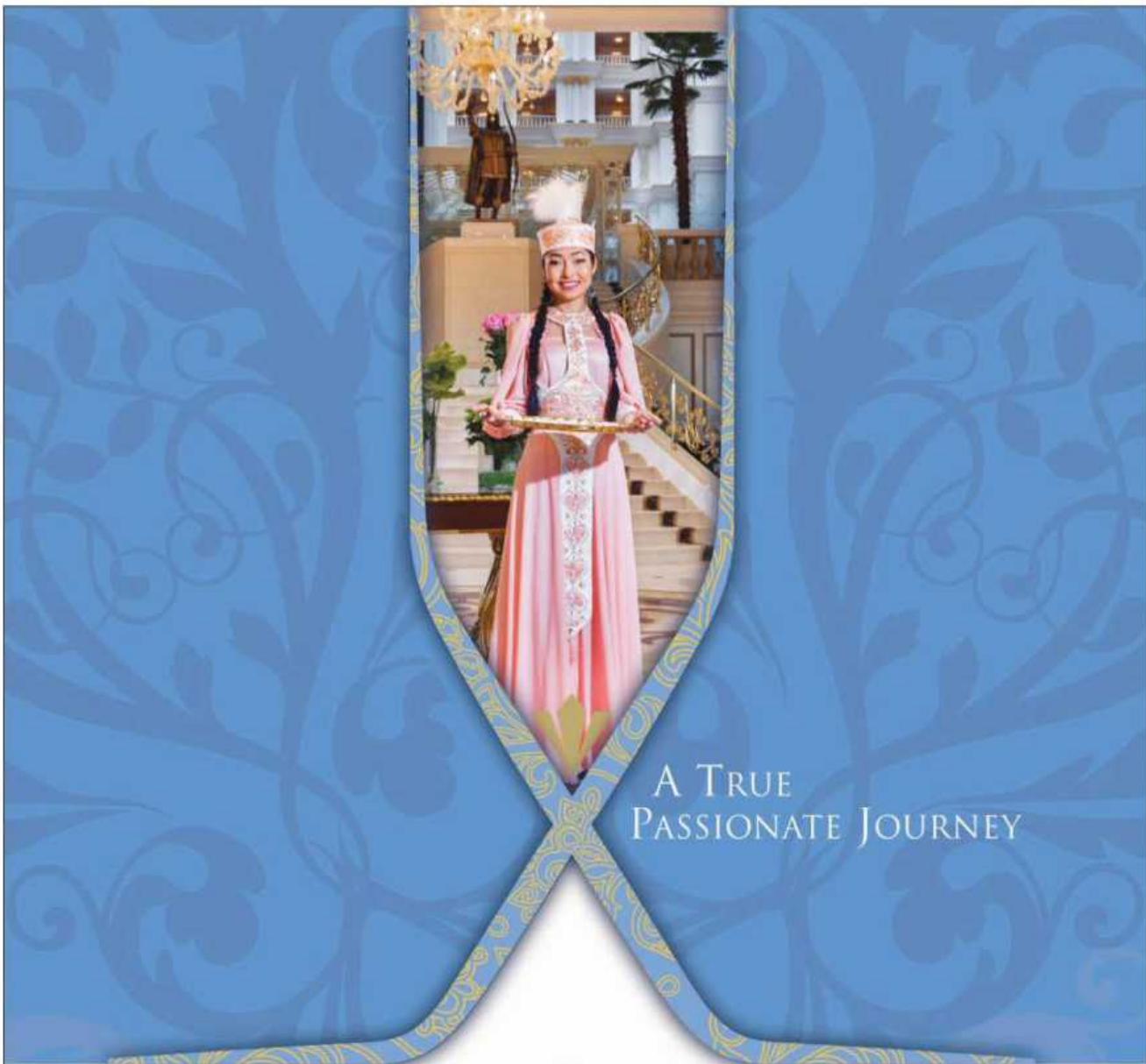
You can trek across its steppes, keeping an eye out for endangered animals; take a dip in its lakes, like the Caspian Sea, the world's largest; or ski on its snowy slopes, as Prince Harry did in Shymbulak in 2014. Or check out more quirky destinations, such as Baikonur cosmodrome, a Soviet-era gulag, and even a tropical beach, albeit indoors on the top floor of the Khan Shatyr Entertainment Centre.

To deal with increasing demand, the number of hotel rooms is rising fast. In 2014, there were nearly 50,000 nationwide, 13,000 more than two years previously. Now, Kazakhstan's tourist board says over 70 new establishments will be added to the inventory in Astana alone in just three years.

At the top end of the hospitality sector is Rixos Hotels, which operates four of its 29 hotels worldwide in Kazakhstan. With establishments in Astana, Almaty, Shymkent, and Borovoe, it already has 800 rooms and plans to open more, says Thomas Noll, Rixos Kazakhstan's General Manager: "The opportunities I see are five-star resorts, in the mountains [and] on the shore of the Caspian."



**Thomas Noll,**  
General Manager,  
Rixos Hotels Kazakhstan



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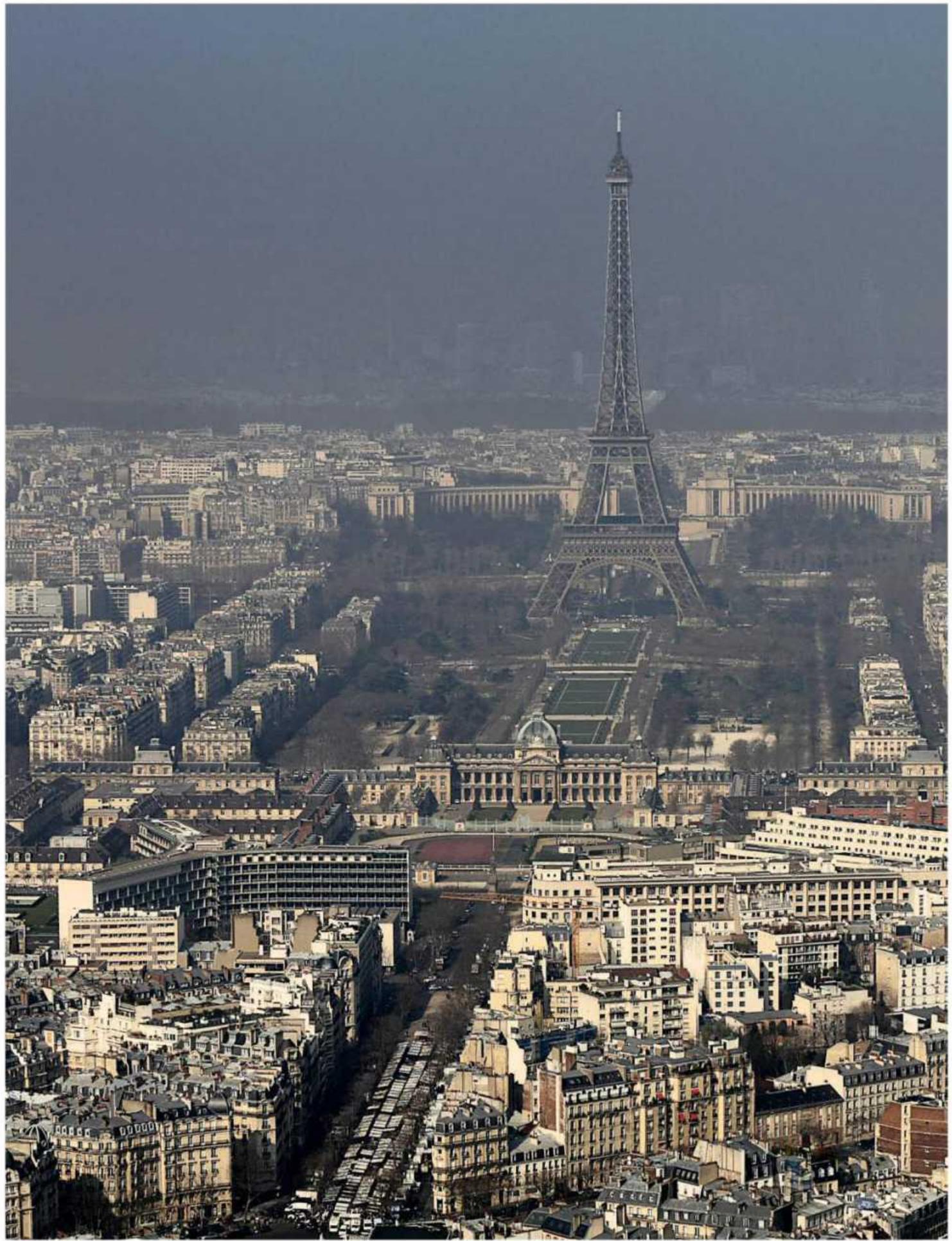


RIXOS KHADISHA SHYMKENT

WHO KNOWS THE OTTO MAN?

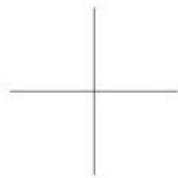


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# NEW WORLD



WEATHER

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COP 21

## MATTERS OF THE EARTH

The climate talks convening in the City of Light this month could be the planet's last chance at survival

**A LIGHT IN THE DARK:** Representatives from dozens of countries will meet in Paris for a U.N. climate summit whose success many experts believe is essential to keep the globe from irrevocably overheating.

**FOR 20 YEARS** running, the U.N. has held an annual conference on climate change. Never in the two decades of meetings, talks and lobbying have the assembled delegates managed to procure what is needed most: a legally binding and universal agreement on how to slow the rise of global temperatures. They came close in 1997 (Kyoto) and in 2009 (Copenhagen), but those two conferences, like the other 18, failed.

The importance of the 21st Conference of the Parties in Paris cannot be overstated. The host city is reeling from a deadly terrorist attack on November 13 that left over 120 dead and 300 wounded. A number of planned demonstrations, concerts and festivities will be canceled, but the core event of COP21 will go on: Starting on November 30, leaders and high-level officials from 196 parties have 12 days to reach an accord that could save the planet. The primary objective

is to divvy up carbon cuts to reduce worldwide greenhouse gas emissions and cap global warming at 3.6 degrees Fahrenheit over pre-Industrial Revolution levels by 2100. That's roughly the point at which, research suggests, the ice sheets in Greenland and Antarctica will start to melt at an unstoppable pace, prompting a catastrophic rise in global sea levels. Parts of the world will be hit by devastating floods while others will experience severe droughts that will lead to famine.

Negotiating how to limit global warming may prove difficult; achieving a binding agreement will prove even harder. "We have a long history of countries saying they'll do something and then not doing it," says Columbia University's Scott Barrett. The protocol that came out of Kyoto, for example, was legally binding, committing 37 industrialized countries and the European Union to reducing emissions by 5 percent against



1990 levels from 2008 to 2012. But it collapsed. Though the U.S. signed the document, Congress later refused to ratify it. Other countries, including Canada and Japan, failed to meet their targets—without repercussion. And developing countries, such as China and India, were exempt from emissions reductions entirely.

In 2009, COP15 again tried to reach a universal, lasting agreement. After days of fraught negotiations, the conference frantically pulled together a document at the last minute called the Copenhagen Accord. It included an agreement

that deep cuts to worldwide emissions were required and that global temperatures should be limited to the 3.6-degree increase, but there was a crucial deficiency: It wasn't legally binding. The conference as a whole voted only to "take note" of it. Venezuela, Bolivia, Ecuador and Cuba didn't agree to the accord—their delegates criticized the fact that they were excluded from the drafting process by the larger, wealthier member states. Bill McKibben, co-founder of 350.org, a New York-based climate change campaign, told news outlets at the time that the Copenhagen

**PLANETARY BLUES:**  
A dome holds an exhibition on climate, installed in the courtyard of the environment ministry in Paris, in the run-up to COP21.

Accord was “a declaration that small and poor countries don’t matter.”

This time around, to engender stronger feelings of inclusion and generate greater participation, the U.N. has asked each member state to submit an Intended Nationally Determined Contribution prior to the meeting. Essentially, this allows each country to list the emissions reductions it intends to make by 2025 or 2030, as well as other planned efforts to combat climate change. The idea is that the conference can then draft a protocol knowing in advance what member states are prepared to accept. Despite the inclusionary approach, many countries still seem resistant: By the submission deadline of October 1, 50 of the 196 parties had not sent in their INDCs.

But it’s not all silence and missed deadlines. India, which has proved disagreeable in the past, appears eager to help make COP21 a success, says Liz Gallagher, who leads the Climate Diplomacy program at the nonprofit environmental policy organization E3G, which is headquartered in London. According to Gallagher, India is likely to come to the conference in a cooperative mood. The country has begun investing heavily in solar power development, and Gallagher believes Indian Prime Minister Narendra Modi will attend COP21 hoping to win foreign investment in this project.

The heroes of COP21 could be the U.S. and China. Though China is the world’s biggest carbon emitter and historically intransigent on environmental issues, it is now focused on investing in renewable energy and reducing its domestic pollution, which is responsible for the deaths of 1.6 million Chinese people a year, according to scientists at the University of California, Berkeley. Beijing has already agreed to ensure that its emissions will peak around 2030.

Meanwhile, U.S. President Barack Obama has been stressing the importance of action on climate change throughout his second term in office. From June 25, 2013, to June 25, 2015, the president made some mention of climate change once every 4.5 days, according to the White House. COP21 is the last big conference before his presidency ends, and Obama will want to round off his climate legacy with a decisive win. The president recently garnered praise from various environmental campaigners after he rejected an application to build the Keystone XL oil pipeline from Canada to Nebraska. Like



China, the U.S. has already made an emissions reduction commitment—vowing to cut its emissions by 26 to 28 percent, compared with 2005 levels, by 2025.

Even with the cooperation of the U.S., China and India, as well as that of the climate-conscious EU, problems remain. Oil-rich nations, such as Qatar and Saudi Arabia, are likely to be troublemakers at COP21, says Gallagher. They risk losing revenue if other countries shift to renewable

## THE COPENHAGEN ACCORD WAS “A DECLARATION THAT SMALL AND POOR COUNTRIES DON’T MATTER.”

energy sources or cut down on oil exports in an attempt to curb their emissions. Several other oil-exporting nations, including Iran, Iraq, Kuwait, Nigeria and Angola, had yet to submit their INDCs by press time, indicating an unwillingness to engage on the issue of climate change.

A second set of holdouts, according to Gallagher, are Bolivia and Venezuela, whose socialist governments resent what they perceive as interference from bigger, richer countries. Venezuela and Cuba—which opposed the Copenhagen Accord—also had yet to release their pledges.

Though developing nations will have more input this time around, there is little to deter countries from ignoring whatever deal is made. Though Gallagher and Barrett both say some form of universal agreement will be reached, they are unsure whether it will be any good, practically speaking. For example, dissenting countries, Gallagher says, may water down the wording of any accord, ensuring that the language is kept as vague as possible. And 12 days may not be enough time to agree on carbon cuts, funding and how to slow the rise in global temperatures. COP21 has set itself a very ambitious goal; it is looking unlikely that it will meet it. ■



DISRUPTIVE

## THE WEATHER CHANNEL-CHANGER

# We can learn how to turn down the Earth's thermostat, but do we dare?

**SOMEWHERE** on the planet, there must be one small knob we can turn that will send global warming into reverse. Maybe it's that proverbial butterfly in China, and we have to stomp on it before it flaps its wings and sets up a breeze that causes El Niño to melt Antarctic ice.

But to find the knob, we'll have to understand weather as we've never been able to. Forget about forecasts that tell you it will snow 6 to 8 inches tomorrow. That's about as useful to weather control as predicting that if you drink a liter of Jack Daniel's, you'll wake up with a headache. We need to know, in micro-detail, how weather works and exactly what will happen if we adjust its mechanisms.

We're getting closer. And if you follow the technology's trend lines, it seems possible that we can learn how to turn down Earth's thermostat. Then we'll have to figure out if it's more dangerous to mess with the weather or just hope climate change doesn't turn New York City into Atlantis. As Harvard professor David Keith once told *The New Yorker* about a possible method of cooling the weather: "When you start to reflect light away from the planet, you can easily imagine a chain of events that would extinguish life on earth."

In other words, we *really* don't want to turn the wrong knob.

This is an auspicious time in the understanding of weather. As IBM Research weather scientist Lloyd Treinish tells me, there are three important pieces to weather modeling. The

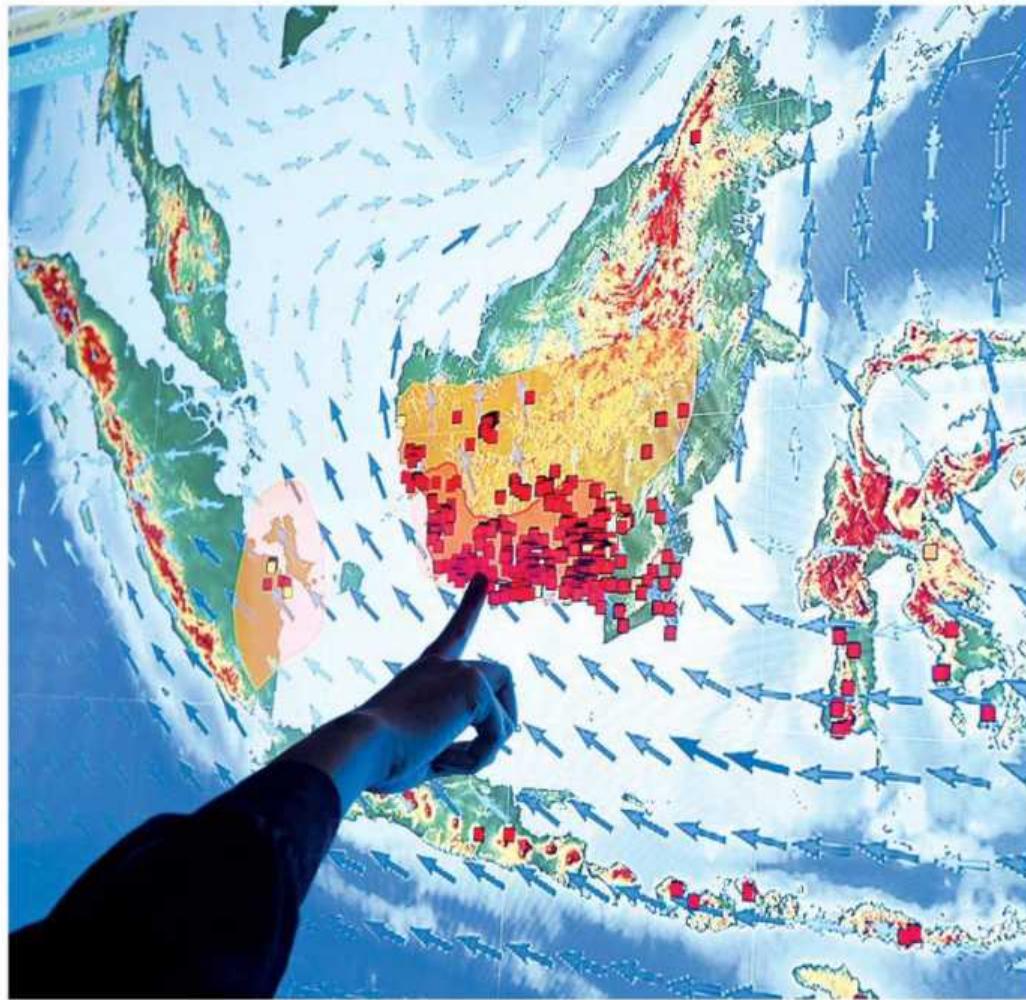
first is getting enough data from weather monitors to analyze. Second is having the computing power to crunch such voluminous data and run it through the weather-modeling algorithms. The third is the quality of the algorithms, which, in a circular manner, relies on scientists understanding weather well enough to write equations that help us better understand the weather. "Each feeds off each other," Treinish says. "Over a period of only a few years, there can be dramatic changes in what can be done."

So let's start with data inputs. The more tiny variations in weather that can be captured and crunched, the better. Weather data today comes in from far more sources than ever. IBM is buying the Weather Company for \$2.5 billion, in part to get its 147,000 micro-weather stations around the world. For perspective, McDonald's operates a measly 35,000 restaurants. Weather prediction today is roughly twice as accurate as it was a few years ago, and so much data is a big reason.

So imagine if today's data is like a sprinkle before the deluge. We're at the dawn of the Internet of Things, which promises to distribute billions of sensors worldwide, many of them capable of reading temperature, wind, humidity or other qualities. A company called Sensity promises to turn every streetlamp into a smart sensor that could contribute weather data. In the next decade, scientists will in some cases be able see weather differences from one end of the block to the other.

As always, the challenge of so much data is

BY  
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**HOT TIPS:** One of the biggest challenges in manipulating the weather is the endless and often unpredictable variables, such as forest fires in Indonesia, above.

having the computing power to use it. This fall, the National Oceanic and Atmospheric Administration, the U.S. grand weather poo-bah, is installing two supercomputers that will give the agency a tenfold boost in capacity. If you look out a decade from now, potential computing power available for modeling the weather will seem almost infinite from today's viewpoint.

The likely holdup will be the algorithms. Weather is perhaps the most complex system on Earth. It follows known laws of physics, but patterns can be altered by random acts of chaos. That butterfly in China contributes to weather changes, as does a jumbo jet takeoff, a volcanic eruption and your dog's flatulence. Models improve as scientists compare their predictions to data about what actually happened, so the rush of new data and computing power will continue to hone the algorithms.

How good can we get? Today, models can forecast most weather three to four days out with pretty reliable accuracy. A few years ago, the best was one to two days out. The pace of improvement is speeding up. Treinish says the models can never be perfect—there's too much complexity

involved. But our understanding is getting much better very quickly.

The thing is, we already know we can change the weather. Scientists have studied the way volcanic ash lofted into the atmosphere can block sunlight and cool the planet, and they have theorized about ways to release reflective particles in the sky to do the same. Cloud seeding works—the Chinese in 2008 used it to make sure clouds dropped their rain before drifting over Beijing's Olympic stadium.

Weather control has been a discussion for a while. So-called "geo-engineering" is both real and a preoccupation of the conspiracy theory set. In 1996, the U.S. Air Force published a study, *Owning the Weather in 2025*, that concluded, "Achieving such a highly accurate and reasonably precise weather-modification capability in the next 30 years will require overcoming some challenging but not insurmountable technological and legal hurdles."

The Chinese employ 37,000 people in something called the Beijing Weather Modification Office. Sooner or later, some outfit is going to grow

## THE CHINESE EMPLOY 37,000 PEOPLE IN SOMETHING CALLED THE WEATHER MODIFICATION OFFICE.

tired of painstaking political solutions to climate change and try something radical.

The key, then, will be having the computer models that tell us what will happen if we muck with the weather and how to deftly turn the fine-tuning knobs instead of throwing a big risky switch. Otherwise, as the Harvard guy said, we could wind up making the planet into a permanent snow cone. ■



## GREEN SMOKE SCREEN

Your environment-loving city is probably outsourcing its pollution to a poorer urban area across the globe

**HUMANS ARE** in the midst of what might be the biggest and most transformative mass migration in our species' history. In the middle of 2009, the number of people living in urban areas surpassed those in rural areas; by 2050, two-thirds of humans will be city dwellers. It will transform everything, creating new and pressing issues in the realms of public health, food security, economic stability—and environmental safety.

Later this month, climate negotiators from over 190 nations will convene for the 21st Conference of the Parties, or COP21. But perhaps the United Nations should have named it the Conference of the City-States. That's because converging on Paris this year will be mayors of cities on every inhabited continent. And any consensus these urban leaders reach might have the biggest global impact of anything that comes out of COP21.

"When it comes to climate, cities are where the action is," says Michael Bloomberg, the former New York mayor who was appointed the U.N.'s special envoy for cities and climate change in 2014. He is now at the center of efforts to propel cities into the center of the global climate negotiations. Bloomberg dubs the growing population of urban dwellers the "Metropolitan Generation," and the U.N. estimates that the cities they live in are responsible for three-quarters of all greenhouse gases. This makes them a critical factor in the effort to restrain emissions enough to prevent the potentially catastrophic effects of



a temperature rise of more than 3.6 degrees Fahrenheit over the coming decades.

The impact of climate disruption is already being vividly experienced in many cities around the world. Every inch of sea level rise threatens

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**METROPOLITAN GENERATION:**  
Michael Bloomberg,  
the U.N.'s special  
envoy for cities and  
climate change,  
says urban centers  
need to lead the  
planet to greener  
pastures.



more homes, highways and businesses, and extreme storms can devastate infrastructure and housing stock, as occurred with Hurricane Sandy. This past season, wildfires have taunted cities on the edge of grasslands and forests in the Western and Southwestern U.S.; for every 1.8-degree Fahrenheit rise in temperature, the risk of wildfires increases as much as 100 to 300 percent. A recent economic study conducted under the watch of two former U.S. treasury secretaries—Republican Hank Paulson and Democrat Robert Rubin, working with Bloomberg—estimated that hundreds of millions of dollars will be added to city budgets from climate-related disruptions if emissions continue on the same trajectory.

Municipal officials are normally overshadowed by more powerful heads of state, and in the past they have been largely left to improvise through the formidable challenges presented by climate-related disruptions. But mayors have far more room to act than national governments, which are often hamstrung by fossil fuel companies trying to influence climate policy. Local governments also have far more control than their national counterparts over a multitude of quotidian factors that are significant contributors to greenhouse gas emissions—from transporting people to and from work, to processing waste, to the efficiency of electricity use in offices and homes.

However, to date there's been little global coherence to urban climate strategies. "Thousands of cities are undertaking climate action plans," the Intergovernmental Panel on Climate Change wrote in 2014, "but there has been little systematic assessment of their implementation, the extent to which emission targets are achieved, or emissions reduced."

One of the biggest challenges cities face in getting together on a plan is a new twist to the ongoing tension between the haves and have-nots that has resonated at every climate summit. In this instance, it's about how to deal with the large discrepancies between who creates greenhouse gases from industrial production and who consumes the goods that are produced. For cities in developed countries like the U.S. and those in Europe, reducing emissions is largely about the nitty-gritty of urban life—from encouraging mass transit to more efficient waste-disposal systems. When Bloomberg was mayor of New York, his administration increased energy efficiency

in office buildings and homes, planted a million trees to soak up carbon from the atmosphere, and bolstered public transit, setting the city on a path to reduce emissions by 20 percent by 2030.

However, although relatively wealthy cities like New York and San Francisco are taking important steps to make themselves more green, they are not yet taking into account the fact that they might be essentially outsourcing their industrial

## MAYORS HAVE FAR MORE ROOM TO ACT THAN NATIONAL GOVERNMENTS, WHICH ARE OFTEN HAMSTRUNG BY FOSSIL FUEL COMPANIES TRYING TO INFLUENCE CLIMATE POLICY.

greenhouse gas pollution to poor urban centers. When, for example, American steel factories or British textile factories fled their countries in the 1980s and '90s, the greenhouse gases these industries produced went with them. Today, the new industrial cities of the world—Guangzhou in China (steel) or Tirupur in India (textiles), for example—are producing greenhouse gases on behalf of the postindustrial parts of the planet.

In the U.S. and Europe, 21 and 23 percent of greenhouse gases, respectively, are generated through industrial production; in China, the figure is about double that. And the World Bank estimates that at least a quarter of China's emissions are tied to exports to the U.S. and Europe.

"This is certainly a hot-button question," says Elizabeth Stanton, who produced greenhouse gas inventories for several U.S. cities while an analyst at the Stockholm Environment Institute. "There's a big correlation between those cities with a green consciousness and higher income."

Some of the greenest cities in America, measured by emissions per capita and other sustainability factors (New York, San Francisco, Seattle and Minneapolis, for example), are also in the highest ranks of per capita income. The same is true for European cities such as Hamburg, London and Paris. But, as Stanton points out, "in affluent areas what you find is that there's more spending and more income generated to purchase things not made there." Many of those things—cars, appliances, the steel for skyscrapers—come with a heavy greenhouse gas load, raising a difficult question: Who is responsible



for those emissions? Stanton and others have begun to make those calculations, which present a challenge to our definition of what it means to be "green." In the greenhouse gas accounting business, it's known as consumption-based accounting. And most U.S. and European cities have approached it with extreme wariness. "They're not exactly anxious to go figure out how not green they are," Stanton says.

In the few cases in which cities have done the counting, the results have been revealing. In New York, a 2013 greenhouse gas inventory identified the stark difference between production- and consumption-based emissions. The former counts emissions from on-site sources like transport, manufacturing and electricity; the latter counts the quantity of greenhouse gases embedded in what residents consume. Most of the 90 ZIP code-based quadrants on the island of Manhattan, where there is little industry, feature per-household production emissions of between 1 and 5 tons per household. On the other hand, a consumption-based count shows an entirely different result, with most of the ZIP codes showing emissions of from 4 to 10 tons of carbon dioxide per household. In San Francisco, when consumption-based emissions are included, city residents' per capita emissions more than double.

While many cities are making real advances in reducing their carbon footprint, the next level of "greening" will require building a bridge across the large economic divide that separates producers from consumers. But that won't happen until those on the other end of that long supply chain begin to recognize the environmental impact of their consumption. "I haven't yet seen a campaign saying, 'Consume fewer televisions' or 'Don't lease a car every two years,'" says Brian Holland, climate programs director for the Local Governments for Sustainability.

On December 4, Bloomberg and Paris Mayor Anne Hidalgo will co-host the first Climate Summit for Local Leaders, within the larger climate meeting. At least 300 mayors are expected to attend the all-day event at Paris's city hall, the Hôtel de Ville, with the goal of giving all cities a "united foreign policy," says Bloomberg. Their price of admission: to sign a compact committing

them to conduct an inventory of city emissions according to uniform international standards and commit to a verifiable plan to reduce them. For the first time, we'll get a clear picture of where, exactly, urban emissions come from and thus how they can be specifically targeted. It will also offer insight into who may be responsible on the other end of the supply-demand chain; the compact spokesperson claims the process of counting consumption-based emissions will begin next year.

"We can no longer postpone actions against the consequences of climate change, which we already are feeling," says Eduardo Paes, mayor of Rio de Janeiro and this year's chairman of the Compact of Mayors, which offers a forum for cities to exchange information on how best to reduce their contributions to climate change and adapt to its already disruptive consequences. Rio, like other cities in the global south, has experienced a range of recent extreme weather events, including mudslides due to sudden violent rains and a continuing drought that is stressing water supplies across Brazil.

The mayoral compact signatories are hoping to formalize technology exchanges enabling member cities to learn from what Bloomberg

## IN SAN FRANCISCO, WHEN CONSUMPTION-BASED EMISSIONS ARE INCLUDED, CITY RESIDENTS' PER CAPITA EMISSIONS MORE THAN DOUBLE.

calls "an ongoing laboratory" for experiments in limiting fossil fuels while sustaining complex and modern urban infrastructures. Los Angeles gets ideas about rapid transit bus lanes from Bogotá, Colombia; San Francisco offers advice on green buildings to cities in China; New York consults with coastal cities on reinforcing more resilient shorelines. And city planning agencies need to start catching up to the tumultuous physical changes already underway. As Mark Trexler, CEO of the Climatographers, a climate risk consulting firm, puts it, "the normal planning in five- or 10-year increments may become totally irrelevant when major areas of your coastline, for example, may be underwater." ■



# HELP SAVE THE ‘WOW’

These giants of the animal kingdom need help. Despite their strength and cunning they're no match for a poacher's rifle. For 50 years WWF has been securing protected areas worldwide, but these aren't enough to stop the killing. To disrupt the sophisticated criminal gangs supplying animal parts to lucrative illegal markets, we are working with governments to toughen law enforcement. We're also working with consumers to reduce the demand for unlawful wildlife products. Help us look after the world where you live at [panda.org/50](http://panda.org/50)





## UNDERWATER DESERT

# Saving Egypt's breadbasket before it sinks into the sea

**ABDULLAH SALAM** walks up and down his narrow plot, tossing fistfuls of wheat seeds with a light flick of his wrist as the soil squishes beneath his bare feet. “*Elhamdullillah*,” he says—praise God—a strong rain just came through and softened up the ground. A month ago, this earth was as hard as asphalt.

These days, it feels to Salam as if his soil is fighting him. It's quick to dry out, turning hard and gray. The seeds don't seem to like it: No matter how much money he spends on fertilizers, he's getting slightly lower yields every harvest. And no matter how much he irrigates the land, it's always thirsty. Always.

But there's nothing to be done about it, and there's no one to complain to here in Kafr el-Sheikh, in the center of Egypt's Nile Delta, so Salam carries on planting. He, his wife and his 15-year-old son, Mohammed, scatter the wheat seeds around his 2-acre field. Their neighbor then drives his tractor through it, tilling the soil and pushing the seeds deep into the ground. Once that's done, they all have tea and wait.

“The harvest will be in five or six months, *inshallah* [God willing],” Salam says. “One [acre] used to yield 18 or 20 *ardab* [worth \$1,000]. But now we'll probably only get 10.” Salam will sell half of that at market for about \$250, and the other half his wife will mill into flour and bake into bread. But it's nearly impossible to make such a small amount of flour stretch until the next harvest, she says.

This land, where the Nile spreads out to meet

the sea, once grew enough wheat to feed everyone from Cairo to Rome—the breadbasket of the world, they called it. Today, the delta barely feeds the farmers who cultivate it. Salam blames his diminishing returns on rising fertilizer prices and bad luck.

But it's not bad luck—it's the sea. It's warming, rising and expanding onto the low-lying delta lands and seeping into the water that feeds them. By the end of the century, 60 percent of the delta region—including Salam's field—will be so saturated with salt that it will be barely farmable. As much as 20 percent of this once-fertile land will be covered in water. When this happens, two-thirds of Egypt's food will drown, and two-thirds of the country's population will be left homeless and hungry.

### THE SALT SHAKEDOWN

Sadek Mahmoud has been working the plot next to Salam's for 65 years. He remembers when the Nile used to flood his irrigation canals every year with clear, nutrient-rich water. “I used to drink from the Nile right here. And I never ever got sick,” Mahmoud says.

For centuries, farmers relied solely on the Nile to water their cropland, digging a complex network of irrigation canals to connect the entire delta region to the river and its tributaries. But as Egypt's population has soared, so has its water consumption. And as factories, power plants and megacities have emerged along the Nile's banks, the clear, rich water of Mahmoud's

BY

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youth has been fouled by all manner of human, chemical and industrial waste. Nowadays, by the time the Nile reaches Salam's and Mahmoud's fields, it has been reduced to little more than a brown, toxic trickle.

To compensate, the farmers in the area have dug a well. Salam and Mahmoud, along with about a dozen of their neighbors, take turns running a fuel-powered pump to flood their respective irrigation canals with water from the Nile Delta aquifer, a massive underground reservoir, spanning from Cairo to the Mediterranean Sea. On the surface, this seems like a good solution to the delta's water shortage problem, but this sort of pumping is accelerating the region's demise, according to Badr Mabrouk, a hydrology professor at Zagazig University. "When you draw the water up from the deep aquifers, it creates pressure and it draws the sea in," he says.

Rising sea levels had already put the Nile Delta aquifer in peril before farmers began deep-well pumping, Mabrouk explains, but

they have made it worse. The way coastal aquifers work is that they meet and hold back the sea underground at a point called the transition zone: The higher-density saltwater sinks and gets pulled back toward the ocean, and the freshwater remains on top. As long as sea levels—and aquifer levels—remain stable, this meeting point doesn't move.

But if either the sea rises or the freshwater

**DEAD MED:** Farmers like Salam in Egypt's Nile Delta are struggling with lower crop yields as the nearby Mediterranean rises and increases the soil's salinity.

THE CLEAR, RICH WATER OF THE NILE HAS BEEN FOULED BY ALL MANNER OF HUMAN, CHEMICAL AND INDUSTRIAL WASTE.





recedes, this point moves farther inland: The sea advances underground. In the case of the Nile Delta, both are happening and they're happening quickly, Mabrouk says. As the ocean warms and its waters expand, sea levels in Egypt are rising, and the land is sinking at a rate of 0.1 inches per year as a result, according to the Climate Change Adaptation in Africa Program. Meanwhile, excessive pumping is draining the aquifer faster than rainfall can refill it.

Climate scientists and geologists have been warning of the danger of saltwater intrusion in Egypt's delta for decades. But in a country riven with political upheaval and economic insecurity, the environment has never been the government's priority—and still isn't, according to Hassan Husseiny, a water management specialist for the American University in Cairo's Research Institute for Sustainable Environment. "Studies say climate change could begin to have a real effect after 20 years," Husseiny says. "The government doesn't look that far ahead."

But up in the northern delta region, sea-level rise is no longer a matter of looking ahead: On a daily basis, the sea is pounding away at the populous cities of Alexandria, Damietta and Port Said. If the sea rises by even 20 inches (which a

2014 National Climate Assessment projects will likely occur by 2100), 30 percent of Alexandria, a city of 5 million, will be inundated.

In the popular coastal resort town of Baltim, about 30 miles north of Kafr el-Sheikh, mango farmer Mossad Abu Ghali has seen the sea advancing. "I remember when they had to build a new boardwalk because the old one got ruined by the sea," Abu Ghali says. "That was a long time ago, though. Inshallah, the sea is not advancing anymore." Baltim built a seawall in 1992 out of large, concrete tetrapod blocks. This has slowed—but not stopped—the sea's advance. This type of structure, known as a revetment, has an average life span of 30 to 50 years. Already the wall is half-buried in sand.

All along the coast, cities and towns like Baltim have constructed seawalls to try to hold back the water, but even with these measures in place, Husseiny predicts that no fewer than 10 million people would be displaced in the next 30 years.

#### THE DELTA'S ELEVENTH HOUR

In 1972, Egypt launched the Coastal Research Institute (CORI) to "monitor and protect" the Egyptian coast, but to date, its work has focused far more on monitoring than protecting. "There

**SEA ON THE RISE:**  
Massive cement tetrapods lie along the beach in Baltim, on Egypt's Mediterranean coast. The huge blocks are a stopgap to prevent erosion, but the sea is steadily overtaking them.

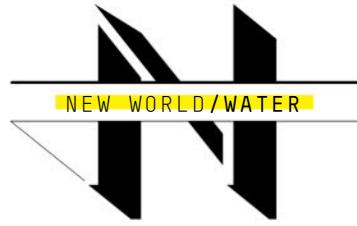
has yet to be any action taken in the delta that I know of," Husseiny says. "There have been conferences and meetings and discussions but no action."

The institute's current flagship program is a joint venture started in 2009 with the United Nations Development Program and Global Environment Facility. The project is to create "integrated coastal zone management systems" on Egypt's coasts by building sea barriers out of natural materials. Six years and \$4 million later, they have managed to "select a pilot site," design an "adaptation technique" and solicit bids from contractors to work on a pilot site—but have yet to build a single sea barrier.

Aymen el-Gamal, CORI's deputy director, works out of an office less than half a mile from the sea, and he doesn't deny the sea levels are rising. But, he says, there is little use in trying to predict the rate at which it will rise—and there's no sense in planning more than one or two years ahead. Most existing models are just alarmist and unhelpful, el-Gamal says. He's also unconvinced human-induced climate change is real. "The Earth is very clever. It can take in energy and emit it," he says. "There are those who say there is the greenhouse effect and the ozone—no, the Earth is bigger than all of this." His smile is confident and kind. "So the climate change from my point of view is a normal phenomenon." Which is why he sees his role as one of simply monitoring sea-level rise and adapting to the data as it comes in.

For farmers like Salam, Mahmoud and Abu Ghali, however, that won't work. The hour is late for the delta. "The land is slowly, slowly running out of time," Mabrouk says. Egypt's primary food source is sinking into the sea while its government—and the international community—watches.

Global leaders are gearing up for the landmark COP21 climate change summit in Paris, where they are hoping to reach consensus on a new set of regulations for greenhouse gas emissions to replace the current Kyoto Protocol when it expires in 2020. But even the most aggressive of global reforms won't do a thing to save Egypt's Nile Delta. Even if global leaders succeed in their goal of limiting global warming to 2 degrees Celsius above preindustrial levels (an ambitious goal to begin with), the seas are expected to continue rising for decades to come, according to a National Oceanic and Atmospheric Association report.



Land loss and damage from climate change are on the summit's agenda, but it's unlikely that Egypt's case will be discussed specifically. Ultimately, the United Nations Framework for Climate Change has left it to individual countries to develop their own National Adaptation Plans. Egypt's prime minister formed a National Committee on Climate Change in July to draft an up-to-date national strategy for combating the problem, but a copy of this strategy has not been made public (if indeed it has been fully drafted).

In the meantime, there has been little if any international pressure on Egypt to update its national strategy expediently. All international critiques of Egypt tend to focus on the country's

## IN A COUNTRY RIFE WITH POLITICAL UPHEAVAL AND ECONOMIC INSECURITY, THE ENVIRONMENT HAS NEVER BEEN THE GOVERNMENT'S PRIORITY

national security problems, human rights abuses and poor democratic governance. As long as climate change remains a second-tier issue for the international community, the Egyptian state—and its people—will also regard it as one.

Even Abu Ghali, whose mango trees could be floating in saltwater within his lifetime, believes tackling climate change should come second to tightening security and restoring the economy. He has full confidence his president will help him in due time. "The government is under a lot of pressure," he says. "We can't expect everything to come all at once. [President Abdel-Fattah] el-Sissi needs to first give jobs to people who need them. Later, he will help us." Inshallah. ■

Partial funding for this piece was provided by the Earth Journalism Network.



+  
**WHO'S AFRAID OF**  
**AYAD AKHTAR?**  
Actors (from left:  
Nisi Sturgis, Bernard  
White, J. Anthony  
Crane and Zakiya  
Young) in a perfor-  
mance of *Disgraced*  
at the Berkeley  
Repertory Theatre.



DOWNTIME

TRAVEL

MOVIES

THEATER

STYLE

TELEVISION

BOOKS

## LOSING HIS RELIGION

Ayad Akhtar's *Disgraced* earned the author a Pulitzer and the scorn of millions

IT'S A STORY he's dined out on many times. In March 2012, Pakistani-American author and playwright Ayad Akhtar was doing his first big Q&A, with *Chicago Tribune* theater critic Chris Jones at an event sponsored by the paper. Akhtar's first novel, *American Dervish*, had just been published to rapturous reviews, and Chicago's American Theater Company was staging the first production of his play *Disgraced*, which would go on to a Broadway run and a Pulitzer Prize the following year. Both novel and play deal with issues of anti-Semitism and Islamophobia, and both feature Pakistani-American men behaving badly: drinking, cheating, beating their wives and taking the name of every lord in vain.

"In the front row were a line of Pakistani-American mothers," Akhtar recalls. "They're all lined up, looking at me askance, arms crossed. At the very end of the interview, one of them raised her hand and said, 'We all drove in from the suburbs. We all read your book for our book

club. None of us are going to speak to you except for me. And I just want to tell you that we need to understand what it is we need to do so that our children don't turn out like you.'"

It certainly wasn't the first time an artist had been reviled by his own people, and the 44-year-old Akhtar has been at the top of the list of important Muslim-American authors long enough to be something of a target. Jones deftly deflected her question by recalling the reaction Philip Roth received for his early books (*Goodbye, Columbus; Portnoy's Complaint*) from some older Jewish readers.

"Roth broke ground for me," says Akhtar. We are having iced tea near Lincoln Center, where *Disgraced* had its New York City debut. "I was reading Roth, [Saul] Bellow, Chaim Potok, watching Woody Allen, watching *Seinfeld*. Those were the artists who made me understand, *Oh, this is how I can write about my community*, which is an American community but also an ethnic

community. It's a religious identity, and it's one that has its own aesthetics and its own humor and textures....Potok was writing about Hasidic Jews in Brooklyn, and I remember reading him as a teenager and thinking, I'm reading about my own people. I know these people. I see them every weekend. They're Muslims in Milwaukee, but they might as well be Hasidim."

*Disgraced* will be the most produced play in the U.S. this coming season, and the playwright says there will be more than 50 productions over the next two years—eight in Germany alone. That puts Akhtar in Arthur Miller territory, the sort of comparison he's quick to deflect. "It's an easy play to put up. It's a single set; it's five characters; it's multicultural," he says by way of explaining the play's seemingly universal appeal. "It makes a case that is exciting to theatergoers, but it's also serving [the theaters'] diversity initiatives. When it's done well, it's a play that delivers a lot of laughs and then a gut-punch, so audiences feel like they've been satisfied even if they're confused."

*Disgraced* falls into a category that might be

called the Exploding Dinner Party Play: As with *Who's Afraid of Virginia Woolf?* and *God of Carnage*, these stories portray a civilized soirée that turns schizo, and nice, educated people who start screaming at one another as the La Tur softens on the cheese plate. Except the subtext here is Islam. The character of Amir is a Pakistani-American lawyer working for a Jewish firm in New York whose life starts to unravel after he reluctantly lends his name (and not even his real name) to the cause of an imam accused of terrorism. His wife, Emily, is a painter drawing on Islamic imagery in her work, and on the evening at the center of the play's action, the couple hosts a Jewish curator (who is interested in more than Emily's painting) from the Whitney Museum of American Art and his wife, an African-American woman who is employed at the same firm as Amir.

With the application of much booze come accusations of infidelity, a debate on political correctness and a not entirely uninformed discussion of Amir's erstwhile faith, with the roles somewhat reversed. "Islam is rich and



**MODERN MAN:**  
Akhtar, who won the 2013 Pulitzer, describes himself as being "formed and informed" by the "spirituality of the Muslim tradition, without believing in the literal truths of any of its tenets."

universal,” says Isaac, the curator. “Part of a spiritual and artistic heritage we can all draw from.”

For Amir, the Koran is “like one long hate-mail letter to humanity”—though he admits to having felt some pride on September 11, 2001. And that’s before things get *really* ugly.

“I think the play is seductive,” says Akhtar. “I think there are folks who would say—and I don’t disagree with them—that there’s something dangerous about this play going all over the country.”

“No one’s writing this [kind of] play,” says *Disgraced* director Kimberly Senior. “It’s not the moody sentimentalism that I think is plaguing theater. Things have gotten very twee, soft and precious. And in walks Ayad with this muscular, sexy, exciting writing.”

Akhtar is now adapting the play for HBO and is hard at work on his second novel. “It’s a saga of a lot of what’s happened in the Muslim community since 9/11,” he says. His first published novel, *American Dervish*, is a coming-of-age story about Hayat, the only child of Pakistani parents, growing up in Milwaukee, grappling with Islam and anti-Semitism and crushing hard on his mother’s best friend. Akhtar, a Columbia University graduate (he studied film there and later theater at Brown), spent years on a “600-page attempt to rewrite Fernando Pessoa’s *Book of Disquiet*, [filled with] plotless philosophical meditations on the machinations of the market”—a novel, in other words, that no one wanted to publish, let alone read—before awakening to the rich material that had been before him all along. It was 2006, his marriage of 10 years was falling apart, and he was having the sort of spiritual-artistic crisis that he tries to describe by paraphrasing Kierkegaard: “Someday, the circumstances of your life will tighten upon you like screws on a rack and force what’s truly inside you to come out.”

He wrote *American Dervish* in a fever, followed quickly by *Disgraced*. The book was published in January 2012, and the reviews were ecstatic. It was sold in 18 languages with deals to be published all over the world. Many Muslim readers, however, were not so enthused.

“On Page 2, Hayat eats sausage, and 40 percent of Muslim readers put the book down,” Akhtar says. “‘Why would I read a book about a guy who eats sausage? I don’t have anything to learn from this guy!’” (At least the aunties who came to the Chicago interview had read the book.)

How did Akhtar’s parents, the inspiration for Hayat’s fictional family in *American Dervish*, feel about the book? “I have every suspicion that



my father has not read the book,” he says. (His father, like the fictional one, is a successful doctor who claims never to have read a book.) “My mother, on the other hand, read it very quickly a few months before it was published, and she called me and said, ‘I want to talk about something, and I never want to talk about it again. I was very happy to see you understood that everyone was doing the best they could.’ I said, ‘That’s beautiful, Mom, thank you.’ She said, ‘I don’t want to talk about it anymore.’”

When asked if he regards himself as a Muslim, the author—who, like Hayat in *American Dervish*, had an Islamic immersion experience in his early teens that reading Dostoevsky in high school uprooted, says, “I take a lead from my smart Jewish friends and say I identify as a cultural Muslim. Which means I feel informed and formed

“WE NEED TO UNDERSTAND WHAT IT IS WE NEED TO DO SO THAT OUR CHILDREN DON’T TURN OUT LIKE YOU.”

by the ethos and mythos and the mindset and the spirituality of the Muslim tradition, without believing in the literal truth of any of its tenets.”

For him, the message is not confined to anyone grappling with one faith, one community. He recalls reading from his novel at the Tattered Cover bookstore in Denver and meeting a young man who had driven 150 miles to hear him. “He came up to me afterwards and said, ‘I grew up in Indiana in a Pentecostal house; your book is the best book I’ve ever read about what it’s like to try and leave a community.’ He was gay, and he wept as he was hugging me. And I thought, *That’s what the book is about*. It’s about the experience of losing your religion, losing your community, but still feeling connected to that past and those people. Still being filled with love for it but feeling separate from it. That’s the story I was trying to tell.” ■



## THE ROYAL TREATMENT

# Hyderabad's Falaknuma Palace, once the home of the richest man in the world, is now a hotel even the untitled can enjoy

ONE OF THE greatest benefits of the democratization of travel is the entrée mere mortals have been given to lives and cultures that previously were inaccessible to all but a select few. So it is with Hyderabad's Falaknuma Palace, which in November celebrates its fifth anniversary as a hotel, having spent much of its life as home to India's wealthiest dynasty.

For some 200 years, Hyderabad, in the south of the country on the Deccan Plateau, was the largest and most prosperous of all the subcontinent's many princely states. It was ruled by a dynasty of Muslim Nizams, who were Turkish in origin. This extraordinary palace was built at the end of the 19th century by Vikar-ul-Umra, who became prime minister of Hyderabad. He eventually gave it to his nephew and brother-in-law Nizam VI.

When Nizam VI died in 1911, he was succeeded by Nizam VII, who held that high office until troops from the newly independent Indian government invaded Hyderabad in 1948 and deposed him. This last Nizam appeared on the cover of *Time* magazine in 1937, billed as the wealthiest man in the world, with a fortune equivalent to \$33 billion today. A titular Nizam, Mukarram Jah, succeeded him as the nominal head of the royal family but is believed to have lost much of the family fortune in divorce settlements. He now lives in Istanbul.

Jah's first wife, Princess Esra, later returned to Hyderabad and oversaw the rehabilitation of

Falaknuma Palace as project manager for the Taj Hotel Group, which leased the building from the royal family in 2000. The new custodians of the palace opened it as a hotel in November 2010, having successfully turned the home of the super privileged into a temporary resting place for the merely very privileged—a 60-room luxury property perched high above the chaos of downtown Hyderabad. Falaknuma was built with Italian marble and was designed to resemble the shape of a scorpion. All of the beautifully restored public rooms are open to guests.

On a recent visit, I arrive at the gate, and an elegantly attired driver and footman take me up the mile-long driveway in a horse-drawn carriage, the same form of transport enjoyed by the Nizams' guests in bygone days. Then, as I enter the palace, unseen staff members on the balcony above shower me with rose petals. By the time I've been led through the grand reception area to my suite, I am beginning to develop delusions of grandeur, reinforced by the constant flow of deferential staff offering to address my every wish. It must have been hell being a Nizam.

On my second day, Palace historian Prabhakar Mahindrakar, a tall, thin, somber man, takes me on a tour of the public rooms. He explains how Falaknuma was boarded up by the early 1950s and says that in the decades that followed the lavish furnishings disintegrated, cobwebs the size of mattresses covered the rooms, and dust

BY  
**GRAHAM BOYNTON**  
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**GRAND RECEPTION:**  
Guests arrive at the Taj Falaknuma Palace in Hyderabad, constructed in 1884. After 50 years of closure, the palace was transformed into a luxury hotel.

and dirt piled up everywhere.

We walk up the marbled staircase with carved balustrades supporting marble figurines, past walls covered with portraits of British aristocrats who had been guests here at the end of the Victorian age; through the Jade Room, with its exquisite parquet floor and matching painted ceiling; and through halls scented with a perfumed oil called *ittar*—a favorite of the Nizams—to the Bar Room, dominated by a pool table that is an exact replica of the one in Buckingham Palace.

And then to the Durbar ballroom, dominated by enormous Venetian chandeliers (Falaknuma has 40, the largest collection in India), and finally to the dining room, which boasts one of the world's longest dining tables; in the heyday of the Nizams, it seated 101 guests. As we end the tour, Prabhakar turns to me and says, almost conspiratorially: "Princess Esra made sure every detail was correct. This is precisely how the Nizams lived."

I spend the next few days living like a Nizam, dining on lamb biryani at the palace's restaurant, leafing through a few of the 5,000 books in the

**COBWEBS THE SIZE OF MATTRESSES COVERED THE ROOMS, AND DUST AND DIRT PILED UP EVERYWHERE.**

teak- and rosewood-lined library, and playing a game of snooker on that pool table.

From this vantage point high above the city, I look down on the bustling urban sprawl that is modern Hyderabad and reflect on the privilege of staying in a hotel that is a living museum. In modern democratic India, the era of the Nizams feels very long ago, but for a brief moment here I feel I have been given a gift fit for a prince: a brief journey back in time—well, almost—to that strange, extravagant period of Indian history. □

**GRAHAM BOYNTON** traveled with Greaves India ([GREAVESINDIA.COM](http://GREAVESINDIA.COM)), which offers a four-night Hyderabad tour, including accommodation at Taj Falaknuma Hotel, private transfers, sightseeing and return flights for \$2,441.



THE CURATED LIFE

## HEAVEN FOR LEATHER

Seraphin, a Paris-based company owned by designer Henri Zaks, transforms animal skins into clothes that surprise and delight

**UPON LEAVING** Bernard Buffet's exhibition of Paris landscapes in 1957 and seeing the city anew through the painter's eyes, Jean Cocteau confided to his diary that "the test that a painter is a painter is when everything starts to resemble his painting."

Among the paintings Cocteau had viewed in Buffet's exhibition was a canvas depicting one of the metal bridges over the Canal St. Martin. It is a classic Buffet; harsh and linear, the branches of the leafless trees clawing like skeletal fingers at a low, steel-colored sky.

Look at it just once, and you will find it has the power to imprint itself on the mind in a way that overlays the real thing when you see it while strolling up the Quai de Valmy, as I found myself doing in October. But looking at that painting, I do not see merely Buffet's depopulated Paris—I also see the kingdom of Henri Zaks. A wiry man in his 60s—with the mind and energy of someone 20 years his junior—Zaks is an artist, albeit one who works with fur and leather rather than oil and canvas, and he works in a building just past the left edge of the scene depicted in Buffet's canvas.

Seraphin is the name given to the company that has, over the years, sprawled to include five nearby workshops devoted to creating some of the finest leather blousons, jackets, coats, parkas and shirts that mankind produces. Make

no mistake, these are working workshops: rolled hides being carried through the porte cochere; men at work with sheepskin mittens buffing and patinating hides; the clatter of sewing machines; piles of hangers, bags and boxes ready to receive finished garments.

Zaks is an artisan and proud of it, but he is a French artisan, so he can hold his own when it comes to discussing such important topics as foie gras and Chateau Petrus. Outward clues to his success are few, however. He gets around Paris on a scooter, and if he has an office at his factory I have never seen it. There is a desk in his light-flooded corner showroom on the first floor, at which he seldom sits for longer than it takes to drink an espresso or, if he is working late—and I have been here at 10 o'clock in the evening—a small glass of cognac. He is simply too excited by what he is doing to sit still.

In 1967, at age 17, Zaks started work in a leather garment factory. There he met his wife, Sara, who still works with him today, carrying out the bespoke orders. In 1975, they decided to set up on their own with a workforce of Sicilian tailors—and that is the key to understanding Seraphin. The company's employees treat leather as a fabric to be worked with, rather than a material that restricts the type of garment that can be made. Thus, Zaks's summer collection today is

### SERAPHIN'S NEW BLOUSONS



BY  
**NICHOLAS FOULKES**



**SKIN ART:**  
Over the years,  
Zaks's Seraphin  
workshops have  
relied on fur  
and leather for  
its coats, shirts  
and blousons.

just as comprehensive as his winter offerings; his whisper-weight, cashmere-soft, parchment-thin blousons in his "nymph" lambskin are perfect for those cooler summer evenings.

He can work in conventional exotic skins and is creating a collection for the Russian luxury goods conglomerate Mercury. To my mind, however, his interpretation of luxury is more about imagination, quality and execution than it is about conventionally precious materials.

What is so remarkable about him is his enthusiasm. He has been doing this for almost 50 years, and yet his eyes almost glow with excitement when he talks about a new way of treating leather: Japanese tie-dye technique applied to Alaskan caribou, for example. Not a common sight anywhere—except the Quai de Valmy.

Indeed, although this is a prototypically central Parisian location, Seraphin is an atlas of the epidermal world. As well as the Alaskan caribou tie-dyed in Japan, Zaks's basement warehouse brims with arcane leathers sourced from corners of the world one never knew of. Since coming to

know him, I have found that my geography has improved, as I have handled, among many others, Afghan goatskin normally intended for shoes but made by him into a spectacular musquash-lined parka; Eritrean and Ethiopian lambskin of an almost immoral softness, perfectly suited to summer leathers; Mongolian goat; Svalbard elk; and

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HIS WHISPER-WEIGHT, CASHMERE-SOFT, PARCHMENT-THIN BLOUSONS IN HIS "NYMPH" LAMBSKIN ARE PERFECT FOR THOSE COOLER SUMMER EVENINGS.

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buffalo from the Hunza Valley in Pakistan.

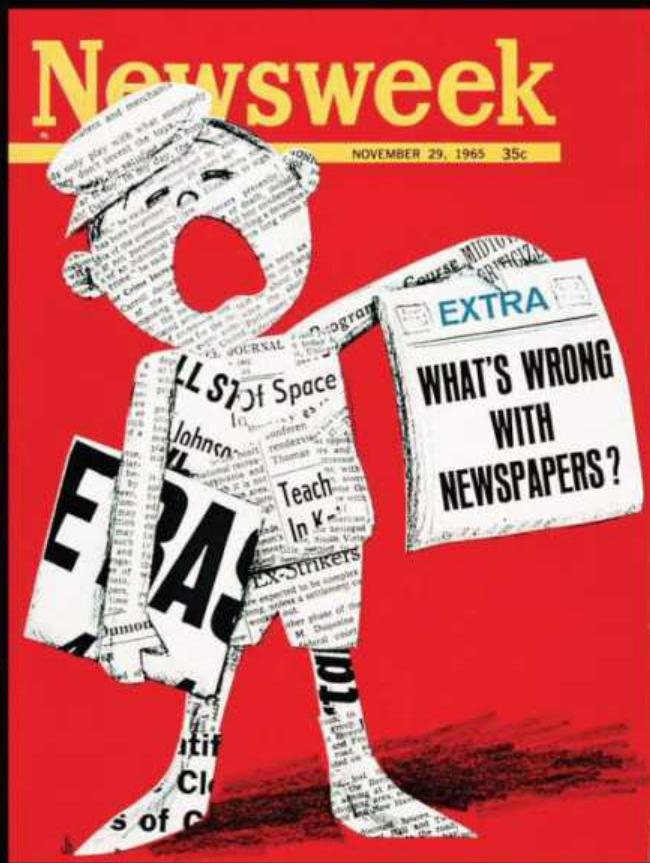
Zaks is particularly excited about the buffalo skin, which he has transformed into suede. "You can look anywhere else in the world, but you won't find this. I buy the raw material over there and then work on it in France," he says, proffering a stout yet sleek blouson in this, his latest innovation.

In addition to locating new leathers, he is always looking for ways to enhance more classic skins, and it is difficult to gauge whether he is more pleased with his Hunza Valley buffalo suede or the Loden finish he has succeeded in imparting to deerskin, using the fibers of the skin to create a nap—the touchable, brushable texture that gives suede its characteristic handle—that to the eye and to the touch is uncannily similar to the famous, hard-wearing Austrian fabric. Only I have yet to see a Loden the color of vintage denim, just one of the prismatic banquet of hues this unusual leather masquerading as fabric is available in.

It is not as though I need a new blouson, but it occurs to me that I ought to have one in Hunza buffalo suede, and I place an order. It is only then that Zaks reveals that for summer he has perfected a nymph version of crocodile, working with a glowing grade of skin to create the unique handle and feel that characterize his work. And although my wardrobe has yet to contain such a garment, I fear that the cost will militate against a purchase. Then again, it is intended for spring/summer 2017—so there is time to save up for it. ■

# REWIND

50  
YEARS



NOVEMBER 29, 1965

QUOTING A FEMALE JOURNALIST IN  
"LE PILL," A STORY ABOUT BIRTH CONTROL  
AS A CAMPAIGN ISSUE IN FRANCE, WHERE  
A 1920 LAW STILL IN EFFECT AT THE TIME  
PROHIBITED THE SALE OF CONTRACEPTIVES  
TO WOMEN (BUT NOT TO MEN)

“What  
French-  
man  
would  
trust his wife with  
the sexual liberty  
that birth control  
makes possible?”

# REFUGEE CRISIS IN EUROPE

FAMILIES FORCED TO FLEE THEIR HOMES

## URGENT



***"It was dangerous to do the crossing but do you know what?  
Compared to everything we have witnessed, all the things happening  
at home, nothing could be as bad. We knew we had to try."***

Mahmoud, father and Syrian Refugee

Over 400,000 people have crossed the Mediterranean during 2015, undertaking unthinkable journeys from countries like Syria, that have been torn apart by war and persecution.

These families are fleeing for their lives, risking the treacherous sea and land crossings. Many having no choice but to board over-crowded, flimsy boats to give their children a chance of safety. For some, this desperate journey will be their last. Almost 3,000 people have drowned trying to reach safety in Europe. The crossing is dangerous but for many families making this journey is the only choice they feel they have.

**UNHCR is on the ground providing life-saving assistance but we need your help.**

You can help provide shelter, food, water and medical care to vulnerable families arriving in Europe.

With so many in need and as more continue to make this journey, your donation today is vital and will help UNHCR to save lives and protect families who have been forced to flee their homes.

**\$120 can provide emergency rescue kits containing a thermal blanket, towel, water, high nutrient energy bar, dry clothes and shoes, to 4 survivors.**



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